2001 CADCA Conference Edition

Finding the Balance: Program Fidelity and Adaptation in Substance Abuse Prevention

A State-of-the-Art Review

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Substance Abuse and Mental Health Services Administration
Center for Substance Abuse Prevention
www.samhsa.gov

Acknowledgments

This document marks CSAP s progress towards fulfilling its commitment to bringing effective, science-based prevention to every community across the country.

One of several in a new series developed by CSAP, this conference-edition document articulates CSAP s policy direction and guidance to the field on prevention programs that we know can be effective in creating positive change. These documents are products of the collaboration among CSAP, States, the National Prevention Network (NPN), Community Anti-Drug Coalitions of America (CADCA), and representatives from both the research and practice communities. As such, they represent our collective best thought and guidance on effective prevention.

As CSAP continues to build its National Dissemination System to identify and encourage effective prevention and provide capacity building opportunities for States and communities, these documents will evolve in nature and content. Throughout this evolutionary process, CSAP will collaborate with States, intermediary organizations, and community practitioners, and will listen and learn about the challenges encountered in moving the field of prevention forward. CSAP will integrate this feedback, developing new guidance to support the field as it continues to grow and advance.

CSAP is proud of our collaboration with the field and the documents that have resulted. We especially would like to acknowledge the significant contributions of Thomas Backer, Ph.D., a senior social scientist affiliated with CSAP s *National Center for the Advancement of Prevention.*

Ruth Sanchez-Way, Ph.D.
Director, Center for Substance Abuse Prevention

and

Paul J. Brounstein, Ph.D.
Director, Division of Knowledge Development & Evaluation

Finding the Balance:

Program Fidelity and Adaptation in Substance Abuse Prevention

A State-of-the-Art Review

This paper was written by Thomas E. Backer, Ph.D.,
Human Interaction Research Institute, one of the team members
of CSAP's National Center for the Advancement of Prevention.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Substance Abuse and Mental Health Services Administration

Center for Mental Health Services
Center for Substance Abuse Prevention
Center for Substance Abuse Treatment
Rockville MD 20857

NOV 27 2001

Dear Colleague:

The Center for Substance Abuse Prevention (CSAP) is pleased to present a new series of knowledge tools intended to assist States, communities, and health providers in delivering effective substance abuse prevention. Designed to promote the use of effective substance abuse prevention programs and practices, these products present the current state of knowledge on effective prevention programming and chart a practical process for demonstrating results.

Prepared for the National Leadership Forum XII of the Community Anti-Drug Coalitions of America (CADCA), CSAP's *2001 CADCA Conference Editions* include:

2001 Annual Report of Science-Based Prevention Programs
From the Center for Substance Abuse Prevention

Comparison Matrix of Science-Based Prevention Programs
A Consumer's Guide for Prevention Professionals

Finding the Balance: Program Fidelity and Adaptation in Substance Abuse Prevention
A State -of- the- Art Review

Prevention Works! A Practitioner's Guide to Achieving Outcomes

Developed by CSAP with its National Center for the Advancement of Prevention, the *2001 CADCA Conference Editions* will be presented at the Forum and made available electronically on CSAP websites specifically identified on the inside back cover of each product.

Please know that you are a valued partner in the national effort to advance the field of prevention. We look forward to working in partnership with you to bring effective prevention to all States, communities, and health providers across the country.

Sincerely yours,

Ruth Sánchez-Way

Ruth Sanchez-Way, Ph.D.
Director
Center for Substance Abuse Prevention

Table of Contents

Introduction

One of the most difficult challenges to effective substance abuse prevention is finding the right balance between maintaining the fidelity of a science-based model prevention program and promoting adaptation of that program to reflect the circumstances of the community where it is being implemented.

The Center for Substance Abuse Prevention, through its National Center for the Advancement of Prevention, is taking a leadership role in (1) synthesizing the knowledge base on this important subject—through this literature review and related products targeted to specific audiences; and (2) mobilizing those audiences—program developers, the prevention practitioners and community leaders who implement the programs, researchers, funders, and public policymakers—to address the need for balance in more rigorous and practical ways. The better we understand the complexities of fidelity and adaptation balance, the more strategically we can approach these issues in our work—and the better the prevention field as a whole can deal with the challenges of balancing program fidelity and adaptation.

The report that follows is an important part of that process. This "state-of-the-art" review, prepared for CSAP, surveys 125 published and unpublished studies related to fidelity and adaptation balance, spanning more than 25 years. An extensive list of references guides researchers to the full body of literature surveyed for this review.

The report first defines several key terms and then reviews the relevant research in some detail. It then presents several conclusions drawn from the literature review. The fundamental conclusion is that **attention to BOTH program fidelity and adaptation during the complex process of program implementation is critical to successful, sustained implementation of science-based substance abuse prevention programs.**

In addition, this paper proposes an initial set of guidelines for program implementers and also several unresolved issues that require attention from each of the primary audiences for this work. The paper concludes with a consideration of next steps for CSAP and others in order to advance the understanding of program fidelity and adaptation balance in substance abuse prevention.

Why Program Fidelity and Adaptation Are Important

Program developers and prevention researchers are legitimately concerned that changes in a science-based program will dilute or even dissipate its effectiveness. Community leaders and prevention practitioners are equally concerned that "not one size fits all." The inability to modify programs may produce local resistance; or worse, rigid fidelity may lead to programs that are irrelevant or even inappropriate for meeting community needs. Policymakers and funders struggle with defining what requirements for fidelity or permissions for adaptation are appropriate in guidance related to funding or public policy.

Each of these groups can contribute to the improved ability of the prevention field as a whole to deal with the challenges of balancing program fidelity and adaptation. For instance, program developers and prevention researchers can use scientific analysis to identify "core components" of effective and model prevention programs—those elements that must be maintained rigorously in order for the program to work. Community leaders and prevention practitioners can develop program implementation approaches that address fidelity/adaptation balance strategically.

Policymakers and funders can build improved standards for fidelity/adaptation balance into grant making and public policy about prevention programming. And all these groups can work together in creating partnerships to change the culture of prevention, so that fidelity/adaptation balance issues can be addressed more effectively when implementing science-based programs in the field.

In a sense, all these groups want to know "what the boundaries are" (Emshoff et al., under review). There is considerable scientific evidence that many science-based prevention programs still produce positive results despite significant adaptation. Some adaptations are, in fact, necessary for program success, given widely varying circumstances in different organizations or communities.

However, there is also significant evidence that the greatest impact from these programs results when there is program fidelity with respect to certain key elements. And some adaptations are undesirable, whether deliberate or accidental.

Efforts both to promote fidelity and to engage in adaptation already happen all the time, of course, but often not as strategically or effectively as would be possible with better guidance. The conclusions and guidelines that emerge from the literature review can help provide a better balance between these concerns.

Examples of Fidelity/ Adaptation Balance from the "Real World" of Program Implementation

In Life Skills Training (LST), a well-validated program developed by Gilbert Botvin at Cornell University (Botvin et al., 1995, 1989), one component involves middle school students talking in their LST sessions about tobacco advertisements. LST's curriculum suggests that students cut out tobacco ads at home and bring them to class for discussion. Sometimes teachers will also ask students to draw their own humorous ads and share them during the LST sessions. This is an example of program adaptation (specifically, an enhancement, since it adds something to LST that does not substitute for any existing component).

Some teachers drop the LST curriculum session on relaxation, because they fear losing control of their students during this enforced "quiet time." Others drop sessions because of time constraints. LST is an eight-session program; but in some schools, only six sessions are available for completing the program.

These adaptations can have a significant bearing on whether the LST experience of some students is really the same as that of others. For LST, as for all science-based substance abuse prevention programs used throughout the United States, having a more unified set of guidance for fidelity/adaptation balance (and indeed, for the entire process of program implementation) and verifying that the implementation was effective would likely improve overall program impact (G. J. Botvin, personal communication, June 2000).

As with other substance abuse prevention programs, many LST implementers are analyzing the program to determine what they believe are its core components, selecting ones that work for them, deleting those that do not, and adding elements they think will improve the program. This program adaptation will go on, says the weight of evidence, regardless of what program developers or researchers think about it.

Likewise, program implementers as well as developers have genuine interest in fidelity. For instance, in CSAP's Model Program Replication grant initiative, grant project directors voiced concern about keeping faithful to the model they were implementing—an interest also expressed by the funder—and they had help from program developers in doing so (Emshoff et al., under review).

The Emshoff study also reported an especially relevant project experience. The program developer pushed for fidelity to a particular aspect of the program that was initially resisted by the implementer grantee. Later, however, the grantee acknowledged that this very component was a significant part of the program's success in its replication setting.

Overview of This Paper

The following literature review examines the impact of program fidelity and adaptation activities during the implementation of substance abuse prevention programs, such as the examples above. The review includes research on both individual programs and meta-analyses of many such programs.

The research confirms that there are real impacts from the implementation activities explored here. For instance, Tobler and Stratton (1997), in one of the largest meta-analyses of school-based substance abuse prevention programs, conclude that "the large decreases in effectiveness experienced when delivered on a large scale suggests factors other than statistical leveling of effect sizes.…Implementation factors provide a more probable explanation and can be a crucial mediating factor in determining success" (p. 114).

The resulting challenges for effective program implementation are not confined to substance abuse prevention programs. Domitrovich and Greenberg (2000) review the body of work on disseminating and implementing effective preventive interventions in children's mental health, violence prevention and school safety, social-emotional learning, and positive youth development—as well as substance abuse prevention. They conclude:

> Surprisingly, many of the highest quality programs fail to take adequate steps to monitor and verify program integrity. This weakens the conclusions that can be drawn regarding the program outcomes and reduces the likelihood that replications will resemble the original program. (p.2)

They also comment about adaptation issues, concluding that in most implementation circumstances, "it will be necessary from the outset to make location adaptations. Further, over time it is likely that additional changes will be made by local program deliverers" (p. 23).

This conclusion emphasizes the importance of not viewing issues of program fidelity and adaptation in an "us-them" conflict between developers and implementers. In fact, program developers are as likely to see the value of carefully executed adaptation as implementers are to see the importance of fidelity. This suggests, importantly, that implementers (prevention agencies and communities) need to be involved at all stages of program development, offering input from their real-world perspective; and developers need to be involved in all aspects of implementation: providing technical assistance and learning from this involvement about improvements that can be made in their programs.

Exhibit 1 shows a conceptual model for stages of program implementation. In this model, implementation is preceded by activities of program development, validation, and dissemination. Upon completion of implementation, often there is feedback to program developers, which may result in modification of the original program (not just of one implementation of it). Between these pre- and post-activities, there are seven stages of program implementation. This model serves as a framework for organizing this literature review. This

state-of-the-art review provides a context for appraising the current status of the field. It includes: (a) key theoretical and empirical studies that have contributed to the present state of knowledge, (b) review papers that provide access to the larger literature, and (c) work specific to substance abuse prevention, with some attention to work from health and education.

EXHIBIT 1:

STAGES IN SUBSTANCE ABUSE PREVENTION PROGRAM IMPLEMENTATION

(Program Development/Validation/Dissemination)

Program Adoption

Needs and Assets Assessment

Readiness Assessment

Program Assessment
Theory and/or Logic Model
Core Components Analysis
Developer Consultation

Program Implementation
Fidelity/Adaptation Balance
Implementation Process
Implementation Setting
Client Characteristics
Larger Context

Evaluation
Fidelity Instrument
Process Evaluation
Outcome Evaluation

Sustainability
Revisiting Fidelity/Adaptation
Routinization

(Feedback to Developer/Program Modification)

Definitions

Terminology varies within the body of research on fidelity and adaptation and related issues. Here are definitions for key terms used in the CSAP studies and in the balance of this paper:

Program: an intervention for preventing substance abuse, usually defined in a manual or curriculum. The emphasis in this paper is on "science-based programs," which are defined below. Programs are a sub-set of the more general term "innovation," which includes many other kinds of ideas or technologies that get implemented by people, organizations, or communities. The latter term is used in much of the wide-ranging literature discussed here.

Program Fidelity: the degree of fit between the developer-defined components of a substance abuse prevention program and its actual implementation in a given organizational or community setting.

In other words, how well does a promising, effective, or model program match the specifications of the original? The program's elements are specified in a program manual, curriculum, or core components analysis (defined below). In essence, the developer provides a "recipe" for replicating the program, and also describes the fidelity instrument(s) (discussed below) for measuring the "fit," or precision, of its implementation.

What we call "fidelity" here also has been called program "adherence" or "integrity" in some of the literature on this subject. Terms from medicine also have been used to discuss the overall degree of fidelity (without necessary reference to program components)—"dosage," "strength of treatment" or "intensity" (Boruch & Gomez, 1977). The latter terms all refer to the amount of a program delivered—what M. A. Pentz (personal communication, April 2001) calls "exposure." In this paper, exposure will be considered part of the larger concept of program fidelity.

The medical term "compliance" means the extent to which a particular protocol or regimen is followed. Compliance as a metaphor for fidelity/adaptation balance will be considered later in this paper.

Program Adaptation: deliberate or accidental modification of the program, including the following:

a. deletions or additions (enhancements) of program components;

b. modifications in the nature of the components that are included;

c. changes in the manner or intensity of administration of program components called for in the program manual, curriculum, or core components analysis; or

d. cultural and other modifications required by local circumstances.

Sometimes there are changes in the target populations for which the program was intended, or changes in the training (Palumbo, Maynard-Moody, & Wright, 1984; Mayer, Blakely, & Davidson, 1986). "Mutual adaptation," a term introduced into the literature by Berman and McLaughlin (1978) in a major study of educational innovations (described further below), involves adaptation both of the innovation and of the organization or community in which it is implemented.

Adaptation also is sometimes referred to as "reinvention" (Rogers, 1995a), and more will be said about this term later. Some writers have referred to "cosmetic" adaptation, as when only the name or some superficial element of a program is changed in order to promote local ownership. And "accidental" adaptation can be superficial or significant, involving changes that implementers do not realize they have made (often because of insufficient technical assistance on implementation).

Fidelity/Adaptation Balance: a dynamic process, often evolving over time, by which those involved with implementing a science-based substance abuse prevention program address both the need for fidelity to the original program and the need for local adaptation.

This balance is achieved at the point of full program implementation, but is not necessarily stable over time. Strategically revisiting fidelity/adaptation balance, in fact, may be an important element in program sustainability, as discussed later.

Core Components: those elements of a program that fundamentally define its nature, and that analysis—from theory, from a logic model, and/or from empirical evidence—shows are most likely to account for its main effects.

Some programs have essentially only their core components. Others have discretionary or optional components, which can be deleted without major impact on the program's effectiveness, or which are not essential for the program's main target audience.

Core components are the essential, or main, ingredients in the recipe. CSAP is currently conducting a core components analysis of effective and model programs, which is expected to be completed in early 2002, as part of developing and maintaining the National Registry of Effective Prevention Programs (NREPP).

Implementation: the complex process by which a substance abuse prevention program is put into place in a community or organization, for use with a particular target audience.

As indicated in the Program Implementation Stages (Exhibit 1), this is a multi-stage process. The first step is *program adoption*—the initial decision to implement made by the implementing organization or community. The related sequence of events ideally (though not always) includes some sort of initial

assessment of needs and assets in the local community, and an a*ssessment of the readiness* of the organization or community for implementation to happen. (Readiness can have a particularly important impact on the ultimate success of the implementation effort.)

An *assessment of the program* itself also can contribute to effective implementation—by helping implementers understand its theory base, by adopting (or constructing) a logic model that presents graphically how the program operates, and/or by interpreting (or in some cases conducting) a core components analysis to determine the fundamental aspects of the program.

The *actual program implementation* includes several sub-stages:

- striking the balance between program fidelity and adaptation
- the sequence of steps needed to install the program fully
- fitting the implementation to the organizational or community setting
- fitting the implementation to the characteristics of the population to be addressed
- fitting the implementation to the larger context (e.g., other important aspects of the community, the current local or national climate for substance abuse prevention, etc.)

Ideally, the programs that continue to operate are those that, as shown through *evaluation*, continue to meet identified needs, are cost-effective, and lack significant side effects. If the program is successful and continues to operate, implementation is followed by some sort of movement to long-term *sustainability*, perhaps including routinization as a part of the host organization or community, (e.g., a line item in the budget for operating the program, etc.).

This model for program implementation stages is an ideal. However, not all prevention programs are implemented following a systematic assessment; not all are evaluated. And though the list of stages suggests a linear order, the occurrence of activities may vary from one implementation to another.

Furthermore, definitions for what implementation includes vary within the literature. Rohrbach, Graham, and Hansen (1993), for example, define implementation as including both quantity and quality elements. They interpret these as program exposure (the number of program components presented and the amount of time spent on each), and program fidelity (measures of the extent to which a program was implemented as designed). M. A. Pentz (personal communication, April 2001) also breaks out exposure and fidelity (adherence to program content, methods, procedures, etc.) and also includes strategic reinvention of the program to increase its adherence in a particular environment.

Here, the definition used separates program fidelity and adaptation conceptually. It also blends exposure and fidelity concepts together in a larger frame. Finally, by this definition, program fidelity/adaptation is considered just one element of a larger sequence of implementation stages.

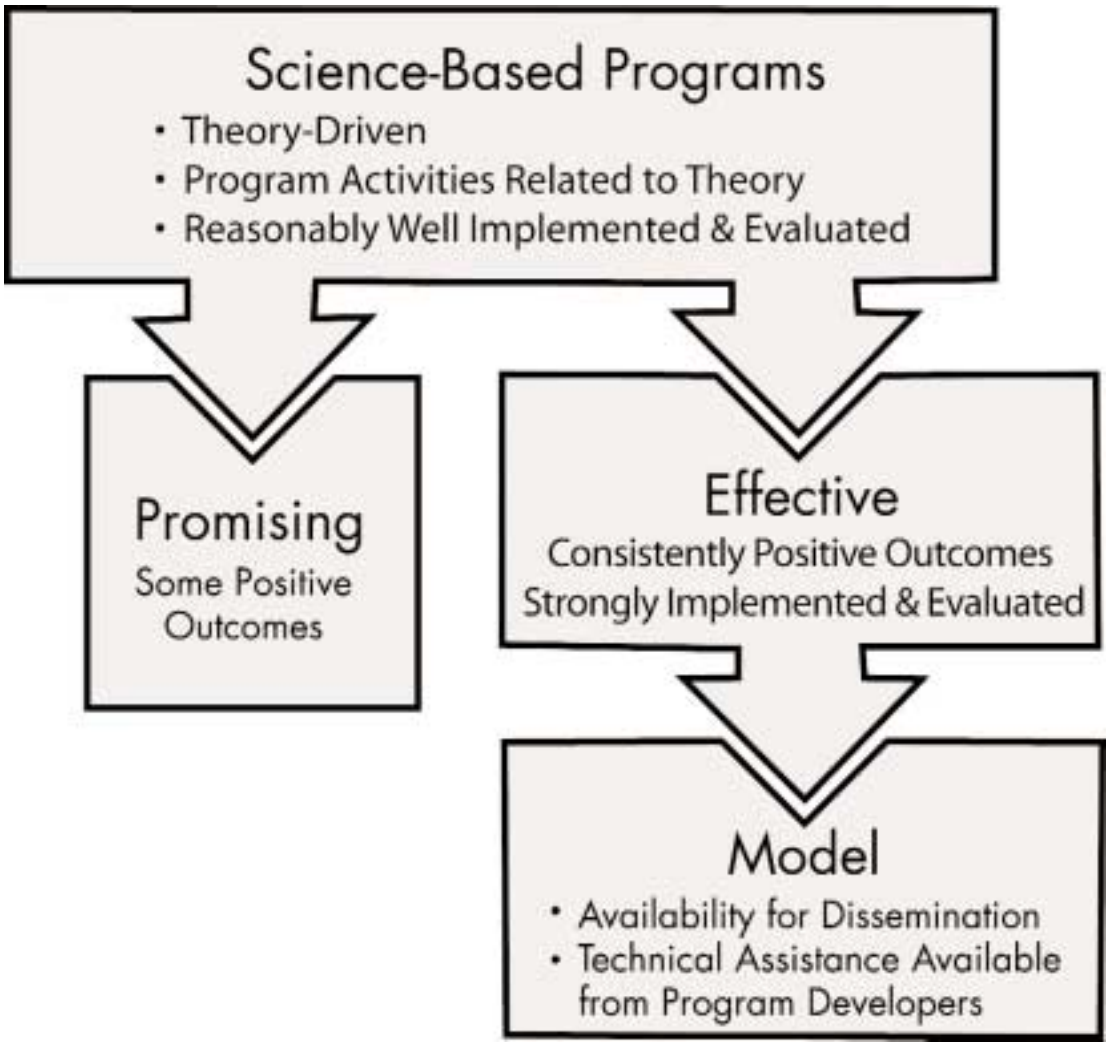
Science-Based Programs: CSAP defines science-based substance abuse prevention programs as those programs that are theory-driven, have program activities that are related to the underlying theory, and have been reasonably well implemented and evaluated in field settings. As indicated in Exhibit 2, CSAP divides science-based programs into three categories:

- *effective programs*—programs that have scientific evidence they consistently achieve positive outcomes

- *model programs*—effective programs that CSAP has made available for systematic dissemination, and for which technical assistance to field implementers can be obtained from the program's developers

- *promising programs*—programs that show some evidence of positive outcomes, but are not yet ready to be classified as effective programs.

Exhibit 2


Science-Based Programs
• Theory-Driven
• Program Activities Related to Theory
• Reasonably Well Implemented & Evaluated
Promising
Some Positive Outcomes
Effective
Consistently Positive Outcomes
Strongly Implemented & Evaluated
Model
• Availability for Dissemination
• Technical Assistance Available from Program Developers

A Resurgence in Interest

Issues of fidelity/adaptation balance related to program implementation have been studied and discussed since at least the 1960s, when applied research in the education and human services fields became more widespread, and the field of program evaluation was born. The impetus came from efforts to explain why so many evaluation results with previously validated programs were null or inconsistent—raising the possibility of an effect from the implementation of the program, rather than the program itself.

In recent years, there has been renewed interest in this subject. For one reason: there simply are more effective substance abuse prevention programs available, resulting in quantitatively greater need to look at fidelity/adaptation concerns. CSAP is generating one central collection of these programs in the National Registry of Effective Prevention Programs (NREPP). Dusenbury and Falco (1995) and Elliott (1998) are examples of other collections.

Research over the last 40 years also has helped us to understand better the complexities of implementation for educational and substance abuse programs. This leads to greater chances for effective intervention. Technologies for managing the implementation process are now available, some of them guided by sophisticated behavioral and management science concepts.

Furthermore, substance abuse prevention programs are subjected to more change, more complexity, and more demands for producing concrete results, while at the same time, substance use persists for certain populations (Backer, 2000). This leads to greater urgency for communities to learn from studies in this field.

Funders are demanding more program accountability (which is easier to do with science-based programs), such as with the nearly 100 grant projects funded under CSAP's Family Strengthening initiative, and the call for science-based programs used as part of CSAP's State Incentive Grant funding. The Department of Education's "Principles of Prevention" mandates similar attention to science-based programs for its grant competitions. And the U.S. Congress now advocates that Drug Free Schools and Communities funds be awarded to communities that use science-based prevention programs.

Also, there is increasing recognition that informally or poorly run programs can do more harm than good in organizational or community settings. As M. A. Pentz points out (personal communication, April 2001), loss of program fidelity can sometimes lead to chaos, because once the program has been modified, no one quite knows how it will operate or what unexpected consequences it will produce.

On the other hand, prevention agencies and communities also face pressures for adaptation. To many observers, program fidelity represents a "top-down" approach to implementing a substance abuse prevention program, while adaptation represents a "bottom-up" approach that may have broader political appeal. Some communities may simply have an aversion to "copying;" they want to be "different," to "be creative."

Even in the best-developed programs, there are often differences in community environments and target populations that really do necessitate certain kinds of modifications. Many of these ultimately are about resource limits, as in the example about Life Skills Training previously described. If a teacher has only so many classroom hours to devote to a prevention program, either a longer program is modified, or it is not used at all. The issue, as previously noted, is one of boundaries: How much fidelity is essential? How much adaptation is possible?

Review of the Literature on Stages of Program Implementation

The stages of program implementation depicted in Exhibit 1 provide a conceptual framework for organizing the review of wide-ranging literature on the question: "How can the balance between program fidelity and adaptation best be set in order to promote successful implementation of science-based substance abuse prevention programs?"

Even though the seven stages noted above are not always followed precisely in the real world of prevention programming—sometimes stages are skipped, or minimized, or conducted simultaneously, or re-arranged—this paradigm presents a useful way of conceptualizing and evaluating whatever process does get followed.

As noted earlier, there are activities prior to implementation (program development, validation, and dissemination), as well as post-implementation (feedback and program modification). However, this literature review focuses on the seven stages in the program implementation model.

Program Adoption

Implementation begins by using available information about a substance abuse prevention program to make a decision to adopt the program. Based on more than 80 years of empirical research (Backer, 1991; Backer, David, & Soucy, 1995; Rogers, 1995b), four key factors weigh most heavily in determining whether information disseminated to potential implementers will lead to adoption of a program:

1. how information about the characteristics of the program itself is communicated to different key target audiences;
2. how information about the efficacy of the program, including both main and side effects, is communicated to particular audiences;
3. how the necessary financial and human resources to support the program's implementation are identified; and
4. how the complex human dynamics of change are dealt with, such as addressing fears and resistances about implementing a program and building a feeling of ownership and participation in it.

Application of these science-based principles for disseminating and implementing programs to the substance abuse prevention field is still limited (Backer, 2000; Backer, Brown & Howard, 1994; Brown, 1998; Lamb, Greenlick, & McCarty 1998; Rohrbach, D'Onofrio, Backer, & Montgomery, 1996). Often the result is failure to adopt a science-based program that might, in fact, have considerable potential for addressing substance abuse prevention goals in a particular setting.

Principles about how people and organizations deal with innovation and change also are reflected in research on fidelity/adaptation and other aspects of program implementation. For instance, Fullan and Pomfret (1977) assert that:

> If there is one finding that stands out in our review, it is that effective implementation of social innovations requires time, personal interaction and contacts, in-service training and other forms of people-based support. Research has shown time and time again that there is no substitute for the primacy of personal contact among implementers, and between implementers and planners/consultants, if the difficult process of unlearning old roles and learning new ones is to occur. Equally clear is the absence of such opportunities on a regular basis during the planning and implementation of most innovations. (p. 391)

Mayer and Davidson (2000) frame adoption (and later implementation) as part of a larger social change model. In this model, program, implementer, and environment interact in a unique pattern that must be addressed sensitively in order for successful change to occur.

Gray, Emshoff, Jakes, and Blakely (under review) add the component of the research process to this social change approach, in the "Experimental Social Innovation and Dissemination" model. This model has been used in a number of discussions about dissemination of education in fields like school health (Basch, 1984). The Hall and Hord (2001) Concerns-Based Adoption Model (CBAM) approach (to be discussed in more detail below) also supports attention to the variables discussed here.

Overall, the science on program adoption and program implementation (including fidelity/adaptation balance) all leads in the same direction: to the usefulness of strategies and principles like the ones outlined in this section in promoting success for the complicated process of change.

Needs and Assets Assessment

A community needs assessment often precedes program implementation. It uses informal processes such as group discussions, or a formal study through written surveys or structured interviews, to identify community problems in substance abuse or related areas (such as violence) for various target populations (most often, the community's youth). In recent years, this deficit approach has been complemented by an assets-based method pioneered by Kretzmann and McKnight (1993). This latter method looks for formal and informal community resources that can contribute positively to the implementation of an innovation.

Arthur and Blitz (2000) provide a paradigm for needs assessment and strategic community planning at the front end of program implementation, which can be used specifically with a focus on fidelity/adaptation balance. This model requires both needs assessment and assets assessment. (The latter may use approaches such as the Search Institute's "positive youth assets" and McKnight's Asset-Based Community Development, or ABCD). Strategic community planning of this type involves not just the adopting organization but the entire community.

Readiness Assessment

As emphasized by Backer (1995a), needs and assets assessment are not the same as readiness assessment. Organizations or communities often need to implement a program and have the assets to do so, but if the key players are not ready to do so, it is unlikely that the program will succeed.

Oetting et al. (1995) emphasize that substance abuse prevention interventions often fail not because they are inadequate, but because communities are not ready to accept and implement them effectively. Therefore, assessing readiness and intervening to enhance community readiness for the kinds of changes required by a drug abuse prevention program are action steps that can greatly increase the actual effectiveness of substance abuse prevention programs.

Oetting et al. (1995) developed a nine-stage model of community readiness for substance abuse prevention programming. Edwards, Jumper-Thurman, Plested, Oetting, and Swanson (2000) provide a practitioner-oriented description of the theory base behind this model, outline a key informant interview method for evaluating readiness, and offer strategies useful for enhancing readiness.

Kumpfer, Whiteside, and Wandersman (1997) also have developed a model of readiness assessment and enhancement specific to the substance abuse prevention field. Backer (1995a) reviewed the larger literature in behavioral and management sciences and presents a number of approaches to assessing and enhancing readiness for change from those areas which have implications for the drug abuse field.

Program Assessment

Three types of program assessments may also be helpful:

Theory and/or Logic Model

Most programs were initially based on theoretical assumptions about what produces behavior change in their target populations (e.g., the underlying reasons teenagers do or do not use drugs, such as peer influences). Knowing what that theory is can help implementers successfully use the programs.

Theory also can be specified in a logic model, which sets forth a chain of conditions for the interventions (also called "mediators") and their presumed results. The logic model can be compared with actual data gathered at each step, helping to establish a chain of causation that may be difficult to detect from simply looking at the intervention made and the result achieved. Logic models have been much discussed in the recent program evaluation literature. Goodman (2000) calls for the use of logic models in prevention, and cites them as prime approaches for assessing implementation fidelity (see also Goodman & Wandersman, 1994; Kumpfer et al., 1993; Scheirer, 1996).

Sometimes program implementers actually stop at the level of theory. They implement only their understanding of the theory behind a program rather than the program itself. This may have value in some circumstances, but it represents a drastic amount of program adaptation under the implementation stages approach suggested here.

Sometimes logic models also are developed atheoretically, on the basis of straightforward operating components of a program. And sometimes, an overall theoretical construct affects every element of program implementation. For instance, the Child Development Project (Battistich, Schaps, Watson, Solomon, & Lewis 2000) is a comprehensive, ecological approach to school-based prevention (including, but not restricted to, substance abuse issues) in which proper implementation means that "the whole school becomes the program."

Core Components Analysis

Methods for conducting core components analysis include analysis of program materials such as manuals; actual observation of programs as they are implemented using some sort of rating approach; and secondary analysis of a program in published literature—or some combination of these methods. These methods can be used by program developers, independent scientists studying prevention programs, and program implementers.

Most core components in a prevention program operate simultaneously or sequentially. There is an assumption that their effects are synergistic. However, research to test this assumption has yet to be undertaken, as M. A. Pentz (personal communication, April 2001) and others have pointed out.

The National Institute on Drug Abuse has initiated a new funding effort to support empirical research aimed at identifying the component parts of effective prevention programs. This initiative is discussed further below.

These methods have been discussed in the program evaluation literature, and also in the prevention literature (e.g., Basch, 1984; Durlak, 1995). For instance, Cook, Leviton, and Shadish (1985) characterize essential program elements as the components of a project necessary for effectiveness. Good program theory generates a causal model that links these components together. Dalton, Elias, and Wandersman (2000) advise developers to specify the key components of their programs, to dovetail with efforts made by program implementers.

Core components analysis has been done in a number of other fields as well. In education, for example, Backer (1995b) describes core components analysis done by the Soros Foundation for the replication of the American Head Start Program in Eastern Europe. Also in the education field, the Concerns-Based Adoption Model (Hall & Hord, 2001) involves a core components analysis using the Innovation Configuration Map process.

Backer (1999) describes a core components analysis for the Arts Marketing Collaborative initiative of the John S. and James L. Knight Foundation. McGrew and Bond (1995) describe core components analysis for Assertive Community Treatment, a well-validated mental health treatment model, using an empirical procedure that may also have implications for the substance abuse prevention field.

As science-based substance abuse prevention programs have proliferated, the same independent analysis has been applied to the core components for a number of programs (Backer & Rogers, 1999). For example, Dusenbury and Falco (1995) identified 11 core components of school-based prevention programs. Hawkins and Arthur (2001) describe the Seven State Diffusion Project and its core components analysis in the substance abuse prevention area.

CSAP, through its National Center for the Advancement of Prevention, is conducting a large-scale core components analysis, as part of developing and maintaining the National Registry of Effective Prevention Programs (NREPP). As of early 2001, NREPP contains 39 programs, with another six “in the pipeline” of final review.

This work started with analysis of fidelity instruments for the seven CSAP High Risk Youth model programs. From this developed a method for identifying core components and rating their degree of implementation. Data were sent to independent reviewers for appraisal and subsequent modification. All of the NREPP programs will be appraised using the revised method (S. Schinke, personal communication, October 2000. For more information about the CSAP core components analysis, contact the Center for Substance Abuse Prevention or consult its online database, www.samhsa.gov/csap/modelprograms/).

Core components analysis can lead directly to the development of fidelity instruments for measuring the implementation of prevention programs. However, as discussed below, such instruments are sometimes developed less formally.

Developer Consultation

The final stage in this pre-implementation assessment involves interaction with the program developer to learn about problems and opportunities in program implementation. This may be especially important in obtaining information about program fidelity/adaptation balance. G. E. Hall (personal communication, March 2001) emphasizes that the ideal situation is one in which two-way communication occurs between developer and implementers. This permits fine-tuning the process by which the program is put into place in a given setting.

Program Implementation

The actual implementation process for a science-based prevention program includes five sub-stages. This section addresses the literature on each:

1. setting the balance between fidelity and adaptation;
2. addressing other aspects of the implementation process itself, such as training for implementation;
3. dealing with characteristics of the implementation setting, such as management support from a school district, or the organizational climate within a community-based substance abuse prevention agency;
4. dealing with characteristics of the clients being served by the program; and
5. putting the program into the larger environmental context of the community, public attitudes about prevention, etc.

These sub-stages also are discussed in detail by Chen (1998). Chen argues that while an intervention (the program) is the major change agent in any substance abuse prevention effort, the "implementation system," as outlined above, is also likely to contribute to program outcomes in important ways.

Fidelity/Adaptation Balance

In a recent comprehensive analysis of fidelity/adaptation issues and the larger context of program implementation, Mayer and Davidson (2000) note that these concepts all emerged originally from the program evaluation field. As mentioned earlier, they sprang from efforts to explain why so many evaluation results with previously validated programs were null or inconsistent.

Research, practice, and theoretical discussions about fidelity/adaptation balance are colored by the complex human dynamics of cultural differences. These include, for example, differences between academically based program developers, who are often researchers as well, and community-based program implementers, who are sometimes grassroots advocates as well.

Differences may also arise from competitiveness, (e.g., in academic publications; also, some science-based prevention programs are now sold commercially). Differences may arise, too, from communication difficulties among people who come from these varied backgrounds. These differences are sometimes further complicated by the number of subject fields in which fidelity/adaptation issues have been discussed, each of which has its own nomenclature.

Particularly the older literature on the subject speaks of investigators of fidelity and adaptation as separated into two "warring camps." One example is the debate in the literature between Fairweather, Tornatzky, and colleagues (e.g., Calsyn, Tornatzky, & Dittmar, 1977) and Backer, Glaser, and colleagues (e.g., Glaser & Backer, 1977) about whether program adaptation does or does not contribute to sustainability (see section on sustainability below).

Some of the distinctions are somewhat artificial; they are not to be encouraged (e.g., see Bauman, Stein, & Ireys, 1991). Certainly there is a vested interest in the "purity" of a program model by its creator, and a vested interest in local control by organizations and communities that are implementing the model programs. But increasingly, both "sides" recognize that the key to program success (as defined by both parties) is to strike a balance between fidelity and adaptation. The remaining problems of human dynamics are likely a matter of communication and coordination.

The proponents of fidelity have tended to assume that altering a program in any significant way will reduce its effectiveness (Calsyn et al., 1977) and makes evaluation of the program across settings difficult (Boruch & Gomez, 1977). However, many studies over the years have shown that programs simply are not implemented with full fidelity no matter what exhortations or claims have been made by program developers. For instance, Tricker and Davis (1988), in a study of implementation of the Here's Looking at You II and Starting Early curricula, found that teachers in one of the three school districts they studied implemented only half of the total lessons in HLAY II because of insufficient time with the materials. There are many other examples, as summarized in reviews like Mayer and Davidson (2000) and Domitrovich and Greenberg (2000).

As previously noted, adaptation is also called "reinvention" in much of the literature on this subject, a term coined by Everett Rogers and his co-workers. Eveland, Rogers, and Klepper (1977) and Rogers (1995b) say that significant reinvention of programs is necessary to preserve program effectiveness. Rogers and colleagues have conducted research on this topic for more than 25 years. They found that programs across a broad range of topical areas and populations are reinvented—with the extent of

reinvention likely to increase over time—often because circumstances change and a program will not remain effective unless it is modified.

In what is probably the largest study of educational innovations ever conducted, RAND Corporation researchers Berman and McLaughlin (1978) found that it was rare that an innovation was adopted precisely. In most cases, not only was the innovation adapted, but changes occurred in the implementation setting as well, a process they term "mutual adaptation," as already mentioned. In looking at a large number of educational innovations, mutual adaptation was the norm for the successful implementations. However, as Datta (1981) has pointed out, innovations in this study were structured to encourage adaptation, which may have affected the outcomes observed.

In a relatively early retrospective study of educational innovations (some criminal justice innovations are included as well), Blakely et al. (1987) reported that innovations implemented with fidelity had greater impact. However, they also found that implementation sites that added a program component were usually more effective than those that made no changes. This is what Palumbo, Maynard-Moody, and Wright (1984) term "constructive adaptation."

In Botvin et al. (1995)'s study of Life Skills Training, only an average of 60 percent of the program was implemented, and this result was felt to represent successful implementation. Adaptation, thus, was occurring on a large scale, based on observer ratings taken for this research.

In this large, 56-school study, implementation fidelity was assessed by direct observation of randomly selected classes, using quantitative data-gathering measures. The comparison of outcomes made between the total sample of more than 3,000 students and those who were in high-fidelity classrooms showed small differences in favor of the high-fidelity implementations. The researchers concluded, however, that in public health terms, these small differences could have a substantial impact on mortality decreases from preventing smoking, if applied on a national level.

An earlier study (Botvin et al., 1989), focusing on urban black youth, found that (despite reasonably good fidelity of implementation of the program) improving the program's effectiveness may require more attention to selecting high quality teachers and on training and supporting the teachers to ensure a high degree of fidelity. As other studies have found, program fidelity is neither automatic nor easy to achieve.

Emshoff et al. (under review) report the results of a fidelity/adaptation analysis of the CSAP model replication grant initiative, which funded replications of 11 science-based prevention programs, each with its own instrument for measuring fidelity (described further below). This study suggested that higher fidelity replications were generally more successful. However, there were a number of exceptions. For instance, program fidelity tended to be less important when there was lower cultural and environmental similarity between the original site and the adopter site.

In this research, mean fidelity scores fell between 1.47 to 1.88 (out of a possible 2 standing for ideal). Thus, there was considerable, but not complete, fidelity of implementation. The investigators reported that a lot of pressure for fidelity came from the funder to the grantees, which may have inflated the results. However, implementers consistently reported that they were happy to have had this pressure, since it led to better program outcomes over time.

Finding the ideal balance between fidelity and adaptation was a deliberate process, the investigators reported. Some implementers asserted that it was most important to maintain rigorously the *principles* of the program, not specific mechanical procedures. This brings into question just what was being held to so closely, because this statement leaves the door open for much adaptation to have taken place. However, the overall result was impact fairly close to that of the original implementation for about half of the replications.

Emshoff et al. conclude that "The conflict between fidelity and adaptation needs to be re-framed as a balance between the two processes. Considerably more research needs to be done to better understand the contexts that influence the ideal balance points." Emshoff et al. also abstract from their experiences with the CSAP replication program what could be generalized as a two-part "model" intervention to promote fidelity:

1. *funding support:* setting up funding so that fidelity adherence is required as a condition of funding, which helps to motivate grantees and increase their attention to fidelity issues, as already observed;
2. *technical assistance:* technical assistance from the program developer needs to be paid for by a funder, because the developers usually cannot pay for the time and expenses involved.

In the case of the CSAP replication program, technical assistance included site visits to developer sites, site visits from developers, and a "replication manual" for each program, which detailed how to implement the program in a new setting. CSAP staff also provided some technical assistance. Just having access to the fidelity instrument was useful for developmental purposes, according to personnel in the replication sites.

Flay et al. (1987), in a quasi-experimental trial of a television and school-based smoking prevention program, found significant problems in the fidelity of implementation for this program. They suggested that before such programs are disseminated widely, research needs to be done to determine what level of fidelity is needed in order to achieve significant program effects (e.g., to deter smoking or drug use onset behaviors).

For more than 25 years, Gene Hall and his associates have been conducting research and developing an underlying theory of educational innovation and change, referred to as the "Concerns-Based Adoption

Model" (CBAM) (Hall, Loucks, Rutherford, & Newlove, 1975; Hall, 1992; Hall & Hord, 2001). Unlike most of the other work cited here, CBAM is not a specific program, but rather a strategy for promoting effective implementation. It guides change through a "change facilitator team," assuming that both users and non-users of the innovation may result. Both exist in a "user system culture" that has an impact on the outcome of the overall effort to implement change.

CBAM has three critical components, each of which is highly relevant to this discussion of fidelity/adaptation balance:

- *Innovation Configuration:* This element of the CBAM model is concerned with defining the core and ancillary characteristics of an innovation so that its level of use can be determined. A complex "Innovation Configuration Map" is then built, with precise descriptions of each component and what constitutes its proper or improper use. Innovation configuration is related to some aspects of both fidelity/adaptation and core components analysis as defined here.
- *Stages of Concern:* This is a six-stage conceptual model for understanding people's feelings and perceptions about the innovation and the change required for its implementation, ranging from basic awareness of what the innovation is, to a level involving ways to improve the innovation after its successful implementation. A Stages of Concern Questionnaire, SoCQ, has been designed to measure these feeling reactions in potential adopters of innovations. This CBAM model component is most closely related to readiness, as discussed above.
- *Levels of Use:* This is an eight-factor scheme for characterizing people's behaviors in terms of what happens to an innovation that is being promoted for adoption, ranging from non-use, through integration and renewal. This again is about modifying the innovation to improve it after it is in stable usage. An LOU scale has been designed to determine where innovations fall as a consequence of the interventions.

In the CBAM approach, interventions can be made based upon the results of these three analyses, each of which increases the chance of implementation success overall. If done properly, Hall and colleagues argue, the chances for an appropriate balance between needed fidelity to the program and needed adaptation are also increased.

It is significant to note that each of the key CBAM model components begs the question of program adaptation. A natural part of the life cycle of innovations, in terms of people's feelings about them (SoC) and their actual use (LOU), involves changes in the innovation. This raises the important notion that fidelity/adaptation balance is a living variable, which may change during the life cycle of an innovation.

A study of Resistance Training and Normative Education, two prevention programs studied as part of the Hansen Adolescent Alcohol Prevention Trial, focused on "program integrity," their term for

fidelity (Hansen, Graham, Wolkenstein, & Rohrbach, 1991). Program integrity was measured by the program specialists who taught the program to students and by trained observers.

Ratings of program integrity were significantly related to outcomes for three of seven mediating variables studied. This suggests that fidelity may play an important moderating function on prevention program effectiveness, especially in immediate outcomes for a resistance skills training program. When the program was well taught, students' resistance skills increased dramatically. The researchers created a general index of fidelity, which was used both by participants and observers to rate the quality of program delivery.

In studying the All Stars Community Program, Hansen (1999) used state supervisor ratings of program fidelity. The results with this rather crude measure, used as part of a pilot program, suggest that programs implemented with high fidelity had better overall effectiveness ratings.

In an effort to understand some of the reasons for variations in fidelity of program implementation, Hansen and McNeal (1999) studied drug education practices among teachers in 12 middle schools, using a minute-by-minute observational approach. They found that teachers understood concepts other than knowledge transmission poorly, and this led to their ignoring other approaches that address risk and protective factors and have been shown by research to have programmatic effectiveness in delaying drug use onset. They conclude that "a relatively radical transformation of approaches to teaching will be needed" if drug education is to be as successful as research has shown it can be.

Pentz et al. (1990), in one of the many studies reported from the Midwest Prevention Project (MPP), also called Project STAR, discuss the effects of program implementation on adolescent drug use behavior. Trained teachers implemented MPP, a school and community-based program for drug abuse prevention. Implementation was measured by teacher self-report and validated by research staff reports. A 10-step model for community organization was created to help support MPP's implementation in the community, including specific efforts to reinforce the implementers for their work.

Quality of implementation (program fidelity) was operationalized in this study to include:

a. adherence (the program was implemented in experimental groups but not in control groups);

b. exposure (the amount of a program delivered to the target audience); and

c. reinvention (the extent to which implementation deviates from the program standard). It found that a high level of implementation can produce actual declines or prevent increases in drug use prevalence rates. However, some reinvention is acceptable, and even desirable. This was operationalized as giving latitude to teachers to personalize the program to fit their students (Pentz et al., 1990).

Sobol et al. (1989) conducted a study of the integrity of delivery of the resistance skills training component of a social resistance smoking prevention curriculum. An "integrity index" was computed for the teachers delivering the curriculum, including their degree of adherence of the program and the quality of their delivery.

Teachers who scored above the median on this index were also more animated, articulate, and confident during program delivery and less authoritarian in their style. The study was notable in that it was one of the first to use ratings (of videotapes made of the teachers at work) by independent judges to measure fidelity. This is seen as an improvement over the typical self-report methodology.

However, this study also points up a possible confounding variable common to many of the studies reported in this section. It is possible that the results observed come not from the teachers' more faithful implementation of the program, but simply that they are better, more conscientious teachers.

Spoth, Redmond, and Shin (1998), in a study involving implementation of Preparing for the Drug-Free Years (PDFY), promoted program fidelity by putting essential program content on videotapes. This was to ensure its standardized delivery and to enhance the learning process by visually demonstrating competent parent-child and family interactions. Trained observers monitored the fidelity of implementation of the intervention, with a focus on coverage of the program content by group leaders. Results showed that 69 percent of the small-component tasks were covered by the leaders.

In this same study, implementation of the Iowa Strengthening Families Program (ISFP) was monitored for fidelity, showing that 83 to 89 percent of the component tasks described in the group leaders manual were covered in the family, parent, and youth sessions for this program.

Spoth, Redmond, and Lepper (1999) examined dosage-related effects of the Iowa Strengthening Families Program (ISFP), as recommended by Botvin et al. (1995). Outcomes were compared between children who attended at least four of the seven sessions versus the entire sample. Reduction rates in alcohol use were higher for these "high-dosage children" (i.e., recipients of a high-fidelity program intervention) than for the entire sample, but this effect did not persist when two-year follow-up data were examined.

These matters of fidelity and adaptation have also been explored in a number of areas outside substance abuse prevention, as summarized by Domitrovich and Greenberg (2000) in a recent analytic review. Without attempting a comprehensive assessment of these related works, a few from the health and education fields are mentioned here for comparative purposes.

Allen, Philliber, and Hoggson (1990) conducted a national replication of a school-based teen pregnancy prevention program, using a fidelity measure of program intensity, program structure, and curriculum use. They found mixed support for fidelity. Only one of three measures of fidelity was related to outcomes: program intensity was; program structure and use of specific program modules were not.

Connell, Turner, and Mason (1985) found that in implementing a school health education program, a higher level of fidelity in program implementation produced only somewhat greater outcomes overall, but very strong differences in improved attitudes about health and self-reported health behaviors. Fidelity was measured in terms of

1. instructional hours at or greater than minimums established by program designers,
2. teaching of 80 percent or more of program activities, and
3. greater than average degree of fidelity to the program materials used.

Dane and Schneider (1998) examined the extent to which five aspects of fidelity were verified in evaluations of primary and secondary prevention programs:

1. degree to which program components were delivered as prescribed (what they call adherence);
2. frequency and duration of the program administered (dosage);
3. qualitative aspects of the program delivery (e.g., content, affective quality);
4. participant responsiveness to the program; and
5. program differentiation (efforts to verify that design conditions apply only to experimental groups receiving an intervention).

Only 39 of 162 outcome studies featured specific procedures for documenting fidelity. And of these, only 13 considered variations in integrity when analyzing the effects of the program. There was mixed evidence about the impact of fidelity levels on program outcomes in the studies for which such data were available.

Detrich (1999) reported a study of programs for serving children with autism, finding that fidelity levels can be increased by matching intervention procedures to contextual variables in the classroom. That is, when adaptations were made that matched the program to the types of interactions teachers were observed to have with their students, the teachers were more likely to follow the adapted program faithfully.

Domitrovich and Greenberg (2000), in addition to appraising progress in the subject fields mentioned at the beginning of this paper, also conducted an actual study of fidelity issues related to 34 science-based programs that prevent mental disorder in school-aged children. They used the definition of fidelity advanced by Dane and Schneider (1998) for this purpose, finding that 76 percent of these programs verified program integrity in some way. They also discussed the conceptual challenges of program adaptation, though their study did not measure adaptations made by the 34 programs.

George, Hall, and Uchiyama (2000) report on the implementation of a standards-based approach to teaching mathematics, finding that student achievement outcomes are significantly associated with

higher teacher fidelity of implementation. They also found that, as measured by the Hall and associates' Levels of Use instrument (Hall et al., 1975), implementation of this major change in classroom practices took place slowly, over several years.

Parcel et al. (1991) studied ways to enhance the implementation of the Teenage Health Teaching Modules, finding that to improve fidelity among new THTM teachers, it is important that they be appropriately trained and that they complete an implementation plan before using the curriculum. It also is useful to include teachers in the initial process of adopting the new curriculum. Even teachers experienced with THTM should receive continuing education to remain proficient in the program's implementation.

Parcel and colleagues measured both fidelity (lack of curriculum modification plus high percentage of required activities taught) and proficiency (progression in adaptation of the curriculum to meet student needs). They found that both were related to higher student knowledge gains among teachers new to THTM. However, for teachers more experienced with THTM, only proficiency was associated with student knowledge gain. These results may indicate that once teachers became experienced with using the curriculum, they could make modifications and still have an impact on student knowledge levels, as long as the teachers remained proficient in using the curriculum.

Implementation Process

Implementation was long thought to be an event in the life of an innovative program that would happen relatively automatically if the innovation was of good quality and information was made available (Rogers, 1995b; Backer, 1991; Backer, David, & Soucy, 1995). More recently, implementation is seen as a complex process that can be thwarted at many levels (e.g., by program developers who do not think it is their concern, by funders who do not require attention to it, or by implementers of programs who do not pay proper attention to it).

Providing training for the prevention workers, and for others whose behavior will have to change to make the program work in its new setting, is at the heart of the implementation process for substance abuse prevention programs. And their behavior has to change in such a way as to permit routine delivery of the new program. Constraints which can negatively affect the implementation process include:

a. lack of time to train implementers,

b. lack of personnel to serve in implementing roles,

c. lack of funds for training materials or for release time to permit training to occur, and

d. lack of administrative support to promote a program's smooth operation.

The research studies reviewed below describe other elements of the implementation process. Most of this research deals with successful implementations. However, there are also many failed implementations. Often implementation failures are unobserved and, even more often, unmeasured. Thus, we cannot learn from them. Moreover, too often the successes are taken as discrete events, rather than processes. The approach suggested here requires looking at implementation as a multi-stage event.

Domitrovich and Greenberg (2000), whose work in this area was mentioned above, advance five rationales for the importance of conducting systematic research on the implementation process:

1. to know what actually happened during the implementation of a program. (e.g., to use in explaining program outcomes)
2. to establish the internal validity of a program (e.g., addressing the dangers of a "type III error," such as assuming that negative outcomes mean that the program is poor, when, in fact, they mean that its implementation was poor);
3. to understand the internal dynamics and operations of a program and its overall strengths and weaknesses;
4. to provide feedback for continuous quality improvement of the program;
5. to advance knowledge about effective strategies for implementation.

As the literature review that follows shows, despite these important goals, the study of implementation process has been limited to date. For instance, Durlak (1997) noted that less than 5 percent of more than 1200 published prevention studies provide data on program implementation. Durlak and Wells's (1998) meta-analysis of prevention programs found that 68.5 percent were described too broadly to be replicated and few included measurement of fidelity. Gresham, Gansle, Noell, Cohen, and Rosenbaum (1993), in reviewing school-based prevention programs, found that only 14.9 percent measured implementation integrity. Furthermore, as Dane and Schneider (1998) point out, "promoting" integrity (e.g., use of a manual, providing training, etc.) is not the same as "verifying" integrity (gathering research data that these interventions were effective in high-quality implementation).

Following are some key studies from the literature on the process of program implementation:

Bauman et al. (1991), previously cited in the fidelity/adaptation section, discuss the importance of site characteristics, social and political context, and population characteristics. These program characteristics interact to produce unique circumstances affecting implementation.

Berman (1980) suggests two different kinds of implementation: programmed implementation (highly planned and routinized in advance) and adaptive implementation (in response to local circumstances). A contingency analysis allows good decisionmaking about which is appropriate to a given situation. Berman offers the following analytic chart to assist with this analysis:

Situation Type

Situational Parameters	Structured	Unstructured
scope of change	incremental	major
certainty of technology or theory	certain within risk	uncertain
conflict over policy goals and means	low conflict	high conflict
structure of institutional setting	stable	unstable

He suggests that this analysis be undertaken, with the larger perspective that structured situations work better with programmed implementation, and unstructured work better with process-oriented implementation, as common sense would suggest.

Berman and McLaughlin's (1978) studies (cited earlier under fidelity/adaptation balance) also found that projects demanding little change in teacher behavior were likely to be implemented in a structured way; and ambitious change efforts that engaged the professionalism of teachers could be made to work with a more adaptive approach. The critical misconception is that the tightness of programmed implementation can compensate for a loosely coupled structure. Many situations call for a combination of the two approaches. Stability of environment is also an important consideration.

Berman (1981) also criticizes the old technological experimental paradigm in which innovations are fixed and have to be implemented like scientific experiments. He instead proposes a new paradigm:

1. change occurs as a result of an implementation dominant process, in which implementing innovation generally requires changes;
2. change requires three processes—mobilization, implementation, and institutionalization—which are loosely coupled, and not linear;
3. outcomes of change efforts are time dependent and context dependent.

There are always issues of clarification. People have to understand the change with some clarity, and this often evolves during the implementation process.

Programmed implementation is highly planned and routinized in advance, while adaptive implementation is in response to local circumstances. Contingency analysis lets decisionmakers evaluate which is appropriate to a given situation.

Dalton, Elias, and Wandersman (2000) provide a community psychology perspective on program implementation. They begin with the assumption that prevention innovations are complex operator-dependent innovations. Implementing them successfully is difficult because they are greatly influenced by decisions made by the people who carry them out. They are also context dependent, fragile in their basic structure, and difficult to specify. They must interact with a number of elements within an organization or community to be effective. As a result, many innovative programs, even those supported by good science, do not get widely implemented, and they cite several studies to show this is the case. They offer a "conductor's guide" to orchestrating implementation of prevention programs.

Felner, Phillips, DuBois, and Lease (1991) review a number of studies that have defined and measured implementation, both from a fidelity perspective and an adaptation or process perspective. In addition to discussing conceptual models for evaluation and how these fit with implementation and fidelity/adaptation concerns, the authors identify a number of measures used in such research. These include: observation techniques, focused interviews, questionnaires, and content analysis for the program or its key documents.

Felner and associates discuss the importance of understanding program implementation before evaluating program effects. They focus on the need to understand the relationship between the fidelity of program implementation, program dosage intensity, and the impact of program effectiveness. They conclude that critical distinctions often fail to be made between programs as designed, programs as implemented, and the impact of such divergence on outcomes.

In an early analysis of the literature on this subject, Fullan and Pomfret (1977) identified five components of innovative program implementation in education, based on 15 case studies in which attempts were made to measure implementation. The five components include:

1. changes in materials (the program content)
2. changes in structure (the system by which the program is delivered)
3. changes in role/behavior of the people who implement the program
4. changes in knowledge and understanding of these people
5. program value internalization by the program implementers

The measurement of implementation is a snapshot of what is happening to the innovation at a given point in time, and different measures may be needed when examining innovations at different points in their life cycles, as argued earlier in this paper.

Fullan and Pomfret (1977) also discuss the RAND studies of Berman and McLaughlin (1978), calling the measures of implementation used in this research "very weak." They are based only on self-reports by users, which can be misleading; and they are global rather than specific.

Fullan and Pomfret assert that a strong emphasis on program fidelity (including measurement of fidelity with quantitative instruments) may be most applicable when studying implementation of prepackaged, relatively explicit innovations. This approach is more questionable when studying innovations at earlier stages of development and use, where adaptation may be more likely.

They conclude that most successful implementation research designs incorporate more than one kind of measurement approach. A comprehensive measurement strategy can encompass a wide range of variables, such as the following:

A. Characteristics of the Innovation
1. Explicitness (what, who, when, how?)
2. Complexity

B. Implementation Strategies
1. In-service training
2. Resource support (time and materials)
3. Feedback mechanisms
4. Participation

C. Characteristics of the Adopting Unit
1. Adoption process
2. Organizational climate
3. Environmental support
4. Demographic factors

D. Characteristics of Macro Sociopolitical Units
1. Design questions
2. Incentive systems
3. Evaluation
4. Political complexity

Some of the implications of this analysis for policymakers include:

a. suggesting that the emphasis should be on both broad-based implementation of specific models and

b. local experimentation should be encouraged during implementation, with documentation of its results; and

c. evaluation at least for initial implementation should be directed towards that process rather than outcomes. Fullan and Pomfret also conclude that the reward system for implementation efforts must be significantly revised if these aims are to be achieved.

Gager and Elias (1997) tested a "resiliency model" for helping prevention programs to survive in high-risk environments, using interventions focused on resiliency factors similar to those found in children who thrive in high-risk environments. Variables predictive of program success can be derived from understanding the school system's own implementation practices. These are not specific to a program, but are part of the school's culture in embracing new programs. Their results show that prevention programs can be successful even in high-risk school districts. Much of that success, however, relates to implementation practices, such as linking programs to the stated goals or missions of the school or district, and having programs carefully planned and carried out by well-trained personnel using engaging materials and procedures.

Goodman (2000) makes the fundamental point that implementation activities have shifted from organizations to communities, and this is another reason why encouraging certain kinds of local adaptations has become so critical. Goodman and his colleagues have looked at the role of community coalitions in developing community-focused implementations, and Goodman, McLeroy, Steckler, and Hoyle (1993) created a measuring technology for their institutionalization. They use a social ecology approach to understand the complex sociopolitical environment in which community decisions about implementation are made and put to work at five levels: individual, interpersonal, organizational, community, and macro-policy.

Leithwood and Montgomery (1980) present a methodology for evaluating implementation. It includes procedures for

1. identifying descriptive dimensions of the innovation,
2. specifying practices implied by the innovation,
3. describing actual practices, and
4. comparing actual with intended practices.

McCormick, Steckler, and McLeroy (1995) studied implementation of school-based tobacco prevention curricula in 22 school districts, using three measures to assess implementation of the curricula. Larger organizational size and teacher training were the strongest predictors of successful implementation. A favorable organizational climate within the school district also favored implementation. Their measures were a Hall et al. (1975) Level of Use questionnaire and two administrations of an implementation checklist at two different times.

Roberts-Gray and Gray (1983) present a model for implementing innovations based on Lewin's (1951) theory of social change, beginning with orientation of the potential user, initiating the innovation, and ending with integrating the innovation into standard practice. These stages fit with the readiness, implementation, and sustainability concepts discussed in this review.

Scheirer and Rezmovic (1983) reviewed 75 projects that involved measuring implementation in nine content areas. More than half of these studies were conducted after 1979, the researchers observe, so this is a relatively young field. The personal interview was the primary data collection measure. They concluded that examinations of the relationship between program implementation and outcome are rare.

Tornatzky and Klein (1982), in a meta-analysis of 75 studies, focused on the nature of the innovation itself in their research on implementation. They found, for instance, that three innovation characteristics (compatibility, relative advantage, and complexity) had the most significant relationship to whether an innovation was actually implemented.

Issues that have yet to be addressed fully in the literature on implementation include:

1. Impact of Policy. Mayer and Davidson (2000), for instance, distinguish between "micro-implementation" as discussed by Berman (1980), and policy or macro-implementation. Most of the studies of implementation concern micro-implementation in single organizations or communities, rather than waves of implementing programs based upon a funding initiative or public policy decision. The characteristics of the implementation process (including fidelity and adaptation issues) may be very different in such large-scale change.

2. Efficacy of Alternative Methods for Implementation. Basen-Engquist et al. (1994) describe a comparative study of live training workshop versus video training strategies for implementing Smart Choices, a school-based tobacco prevention curriculum. Their research found that a lower proportion of video-trained teachers implemented the curriculum, but that overall completeness and fidelity of implementation for those teachers who did teach the curriculum were comparable for the two groups. Video-trained teachers, however, were less likely to use brainstorming and student presentation/role plays, two of the methods prescribed by the curriculum, resulting in some impact on fidelity. These findings suggest that the implementation method needs to be considered carefully in terms of potential impact on fidelity and on overall level of implementation.

Gingiss (1992) provides a number of strategies for enhancing program implementation in the school-based health education arena, all using a peer-based staff development approach. These include:

a. strategies that are sensitive to the "developmental stages" most teachers pass through in learning to implement an innovation;

b. peer collaboration in learning how to implement the innovation and in maintaining it over time; and

c. putting these strategies into operation in the larger organizational context of staff development in a public school setting, ranging from encouraging risk-taking by teachers, to strong emphasis on implementation by school administrators. These methods may also have application in substance abuse prevention.

3. Impact of Implementation Tactics on Program Validity. Palumbo and Oliverio (1989) provide arguments about how lack of attention to implementation can threaten the basic validity of an innovation and the measurement of that validity. Specific tactics of implementation may help protect program validity. For instance, when a program is in its initial stages of development, it necessarily will have somewhat vague goals and less precise connection with theory. Implementation tactics need to be accordingly flexible and adaptive in such situations.

4. Cautions about Implementation Strategy. Based on the literature reviewed here, the following five cautions need to be kept in mind when applying the knowledge base on program implementation, either at the policy or practice levels:

a. If the bar is set too high for statistical evidence of program success, it may be possible to have a successful program no one can use, so it will never be implemented.

b. Communities or organizations must have the underlying capacity to participate in implementation (management skill, technology infrastructure, financial resources, etc.) If they do not, some type of capacity building experience must be provided to them. (Backer and Bare, 2000, discuss the growth of nonprofit capacity building services available in many parts of the United States, which might be harnessed to this task).

c. Durlak (1998) asserts that effective program implementation requires looking at the universe of potential participants to determine whether a significant number of them, in fact, are participating in the program (see section on client characteristics that follows).

d. Durlak (1998) also presents this research concern. There are often a number of prevention programs operating simultaneously in an organizational or community environment. As a result, it may be nearly impossible to obtain a true "no treatment control group" for the target population of interest. (He cites one case in which 90 percent of the students in a control group had, in fact, received another type of substance abuse prevention program during the period of the study.)

e. There is considerable "wisdom literature" on program implementation—qualitative rather than quantitative in nature—which nonetheless provides valuable insights about how to implement a program with an appropriate balance between fidelity and adaptation. Some recent compilations of effective programs, such as Elliott (1998), contain sections presenting implementation concerns and practices based on actual experiences.

Implementation Setting

The organizational or community setting in which the program is implemented can greatly impact both the overall implementation process and fidelity/adaptation balance. Thus, community or organizational interventions may be needed that are separate from program implementation per se (e.g., to remove general attitudinal or practical barriers that otherwise would compromise the success of the program).

Hallfors, Sporer, Pankratz, and Godette (2000) conducted a survey of school personnel involved in the Safe and Drug Free Schools Program of the U.S. Department of Education. They found that limits in time and money were common barriers to full implementation of the program's "Principles of Prevention," (which include attention to fidelity). Many respondents were not well informed about science-based prevention programs, and reported that school districts often adapt the selected programs because of resource constraints in their particular environments. As L. McDonald (personal communication, December 2000) points out, this kind of adaptation is often unhelpful. (She refers to it as "program drift," which she says most often occurs because of financial issues).

Client Characteristics

The psychological and demographic characteristics of a program's clients also can influence implementation or fidelity/adaptation balance. Some client characteristics may not greatly impact robust programs. For instance, many programs seem to be successful without modification of their basic components when used with various racial and ethnic subgroups (although there is anecdotal evidence, as well as long-standing belief, that careful attention must be paid to diversity issues in the implementation process). However, there is little question that some client characteristics can significantly impact the implementation process and its likely outcome (e.g., if clients are unusually difficult, resistant, etc.).

Implementation as related to target population appears in a number of studies about use of prevention interventions originally validated with white (often middle-class) subjects, and then used with minority (often poor) subjects (Backer & Diaz, 1999). The weight of evidence suggests that most substance abuse prevention programs that have been validated with one racial/ethnic group do not need to be substantially modified to work effectively for another. However, language changes may need to be made (e.g., translation into Spanish). Backer and Diaz assert that without culturally modifying the implementation strategy, resistance is likely within the adopting community, individually or collectively, even if the program's scientifically tested efficacy does not require modification.

The literature review in Spoth, Redmond, Kahn, and Shin (1997) shows that recruitment of families into preventive interventions is very challenging, particularly when an at-risk population is required. This is true even for the initial assessment stage of an intervention. In a prospective study of 1,121 families, an early statement of intention to participate and level of education were significant predictors of participation in assessment and intervention. Obviously, if clients cannot be effectively recruited, implementation will fail. Fidelity/adaptation balance might be tweaked to alleviate such situations.

Attrition of participants from a prevention intervention can also be a problem. In a subsequent study, Spoth, Goldberg, and Redmond (1999) found that family socioeconomic status was the only variable that predicted attrition from the intervention under study. Program implementers may find that changes in a program's fidelity/adaptation balance may help with attrition problems as well.

Larger Context

The larger social and political context for a program also can have an impact. Is there community support? What is the overall place of substance abuse prevention on the public agenda? What other prevention programs or related community programs are in place? Everhart and Wandersman (2000), for instance, assert that feelings of community ownership and perceived capacity to deal with the issues of substance abuse prevention often have a disproportionate impact on whether a particular program will be implemented successfully.

Evaluation

Evaluation in the field of implementation of substance abuse prevention programs mainly occurs in the following three arenas:

a. measurement of program fidelity and adaptation, usually through use of a specialized fidelity instrument;

b. measurement of the process by which the program is implemented: and

c. outcomes in terms of impact on the prevention system and on particular target audiences.

Fidelity Instruments

At least since the work of Hall and associates (e.g., Hall et al., 1975), Berman and McLaughlin (1978) and Fullan and Pomfret (1977), alternative approaches have been available to measure empirically the level of fidelity of a program and the amount of adaptation that has taken place. Fullan and Pomfret identify four types of implementation measures, which can zero in on fidelity issues: observation techniques, focused interviews, questionnaires, and content analysis of key documents and curricula. They emphasize that until specific research establishes one of these methods as superior, it is best to use more than one measurement technique when studying fidelity of implementation.

In a related field, Brekke and Wolkon (1988) report the development of a Daily Contact Log. This instrument is used to monitor fidelity of implementation of service programs for people with mental illnesses.

Many science-based substance abuse prevention programs mentioned in this paper, such as Botvin's Life Skills Training (Botvin et al., 1995) and McDonald's Families and Schools Together (McDonald, 1998) have well-developed fidelity instruments. CSAP is assembling a catalog of these instruments as part of the NREPP Core Components Analysis project mentioned above.

Fidelity instruments were also constructed for the 11 CSAP model replication programs, as reported by Emshoff et al. (under review). Each fidelity instrument contains more than 100 items and was developed in close collaboration with the program's developers. In these instruments, each item is scored on a three-point scale, "ideal, acceptable, or unacceptable."

Process Evaluation

Many evaluations of substance abuse prevention programs focus on the activities by which a program is implemented. Such data gathering can provide valuable input for program improvement as a program is being implemented. In addition, this is important documentation about what does and does not work in the process, which may be helpful to others using a program in the future. Good process evaluation

data also can help to build political and community support for a program and serve as an ongoing guide to the fidelity/adaptation process (Glaser & Backer, 1972; Fetterman, Wandersman, & Kaftarian, 1996).

Outcome Evaluation

Ultimately, those involved in funding, implementing, and using a program in an organizational or community setting want to know whether it works. This requires outcome evaluation, which gathers evidence about the impact and cost-effectiveness of a program, such as reduction in substance abuse rates for a particular target population, increased awareness of the problem, etc. (Fetterman et al., 1996). Outcome evaluation also can provide evidence long-term about the quality of the implementation process and the balance between program fidelity and adaptation.

Sustainability

The sustainability of innovations is an issue that has been little explored in substance abuse prevention or other fields (Backer & Rogers, 1999). Sustainability means the long-term survival of a program, once it is successfully implemented (i.e., how to continue a program as long as nothing else better comes along to take its place and it continues to produce substantial positive results without major side effects).

The existing empirical literature about what promotes or inhibits sustainability is based mostly on case study research. Some of the pertinent work includes:

Akerlund (2000) provides a set of guidelines for program implementation that emphasize planning ahead for sustainability (e.g., looking toward long-term funding, ongoing community support, and refinements in operation). The author concludes that sustainable programs are the ones that remain adaptable, all other factors being equal. This analysis is in keeping with the bulk of the literature on this topic.

Altman (1995) argues that sustaining interventions requires fostering long-term collaborations between researchers (or program developers) and communities. In addition, researchers need to look early on for ways that their research can benefit the community after the research is over, such as providing resources to translate the research study into an ongoing substance abuse prevention program that the community will value.

Berman and McLaughlin (1978), in their previously cited study of educational innovations, found that long-term survival was relatively rare. Most of the educational innovations they studied continued in name only, or as pale imitations of the original program.

Glaser and Backer (1977) argue that adaptation is one of the elements that facilitate program sustainability. In two early studies of long-sustained programs in the mental health field (Goal Attainment

Scaling and the Fairweather Hospital-Lodge Community Treatment Program), Glaser and Backer (1980; Backer & Glaser, 1979) developed case studies based on site visits. Results showed key factors in long-term sustainability included:

a. adaptation of the innovation due to changing community circumstances or service needs, as previously argued; and

b. availability—early in the life cycle—of technical assistance on enhancing long-term survival strategies.

Goodman and Steckler (1989) describe "niche saturation": institutionalization through getting into every possible part of a more complex organization, such as all classrooms in a school or all schools in a district. Goodman et al. (1993) developed a measure of institutionalization, with eight sub-scales, to measure these and other elements of sustainability.

Pentz (2000) addresses issues of policy change related to sustainability. She cites a number of studies indicating that both planned and unplanned policy change have a positive impact on program longevity. She considers two types of policy change:

a. those related to *implementation*, such as raising funds, requiring standard implementation, and creating a formal nonprofit organization to implement programs; and

b. those related to *regulations*, such as enforcing monitoring of drug-free zones.

Pentz's review indicates that regulatory policies may show the most immediate effects in implementing substance abuse prevention programs, but programmatic policies are more likely to have long-term consequences. Barriers to sustainability include lack of perceived empowerment by community leaders to continue prevention work; insufficient preparation of community leaders for adoption of science-based programs; the temptation to continue an ineffective approach because of investments already made in it (as happened, for example, with the DARE program); and the general perception that no science-based approach will work because each community has its own unique needs.

Tornatzky, Fergus, Avellar, and Fairweather (1980) studied both the impact of cycles of change (annual budget periods, for instance) and passages (fundamental shifts, such as legislation ending or dramatically changing a funding source) on mental health innovations within a sample of psychiatric hospitals. Overall, the results suggest that passages, much more than cycles, affect sustainability, presumably because the latter tend to involve smaller, more predictable changes.

Yin (1978) studied the life history of six innovations in municipal bureaucracies. In each case, survival of an innovation was tracked through a series of passages (conversion from Federal to local funding support) and cycles (budget periods).

Revisiting Fidelity and Adaptation

One factor cited in the above literature (e.g., Glaser & Backer, 1977) as significant in improving the chances for program sustainability is a planned, systematic revisiting of the balance between fidelity and adaptation as the program continues. Communities and target populations change over time, and the program may need to be changed as a result. If there is either resistance to this, or lack of an infrastructure to make this revisiting process relatively straightforward, the long-term chances for survival are reduced.

On the other hand, what L. McDonald (personal communication, December 2000) calls "program drift" can also occur (i.e., undesirable changes in a program of which the implementers may not even be aware). Revisiting a program can provide an opportunity to refresh it, to bring it back into line with its original intent and procedure.

Routinization

Perhaps the ultimate objective of efforts to promote sustainability of a substance abuse prevention program is institutionalization, or routinization. This means incorporation of the program into the ongoing life of the organization or community, so that sustainability becomes, in some respects, automatic. It might take the form of including funding support for the program in a permanent budget (e.g., as a line item in an annual city or county budget). Or, it might take the form of a policy for permanent continuation, by an appropriate governance body (city council, board of directors, etc.). No routinization is completely permanent, but these larger systems changes do increase the chances that a program will survive over time.

Lastly, sometimes sustainability, even routinization, happens for the wrong reason! The weight of evidence suggests that DARE is not an effective substance abuse prevention program, yet it has had a remarkable degree of sustainability, even routinization, in American communities over the last decade. Rogers (1995a) outlines some of the reasons for this; for example, the DARE program has had extraordinary publicity, support from police chiefs (a powerful force in most communities), and good financial backing.

Main Conclusions from the Literature Review

This literature review started by conceptualizing seven stages of program implementation (Exhibit 1), including fidelity/adaptation balance as one sub-part in those stages. This conceptual framework has been used to organize the wide-ranging literature pertinent to the central question this paper addresses: How can the balance between program fidelity and adaptation best be set in order to promote effective implementation of science-based substance abuse prevention programs?

The seven stages of implementation, as already stated, are not always followed precisely in the real world of prevention programming. Sometimes stages are skipped, or minimized, or conducted simultaneously, or re-arranged. However, this paradigm represents a useful way of conceptualizing and evaluating whatever process is followed.

The most important conclusion from the literature review presented here on each of these seven stages is that **attention to BOTH fidelity and adaptation is essential for successful implementation of science-based substance abuse prevention programs.** That is, fidelity/adaptation is not a continuum upon which each specific implementation of substance abuse prevention program falls. Rather, fidelity/adaptation balance is concerned with the complex, dynamic interaction between a program and its environment. Science and experience say that maximum success requires attention to both fidelity and adaptation.

Out of this assumption come *guidelines for balancing fidelity and adaptation*, which are presented below. These are based upon the literature reviewed and are presented as a preliminary response to requests from the prevention field for a practical means of "setting the boundaries" regarding this issue.

Further refining and improving these guidelines also will require dealing with the *issues for researchers, program developers, implementers, funders, and policymakers* that follow. These represent, in effect, additional conclusions from the literature review. The section on "Next Steps" offers some beginning points for addressing them.

To date only limited attention has been paid to fidelity, adaptation, and other components of program implementation in both the science and practice of substance abuse prevention programming. Yet science shows that dealing with implementation issues is critical to program success. There is even a term in program evaluation—"type III error"—to label the significant number of cases where researchers conclude that a program is not effective, but the real problem is that it was not implemented properly.

Even with science-based programs and good implementation strategies (including attention to fidelity/adaptation balance), there is no guarantee that a program will lead to significantly improved outcomes, such as development of resistance skills, less use of drugs or alcohol than comparison groups, etc. Evaluating implementation efforts and measuring the balance set between fidelity and adaptation have meaning only in the context of outcomes, and these too must be measured by research.

That is, most science-based substance abuse prevention programs now widely used in the field are *research-based*, but not *research-verified* (a concept well-discussed in the education field by George et al. (2000). They have been shown to work in an initial setting, but have not been verified through field research to prove they work in a wide range of organizational or community environments—and as implemented by people other than their developers. In many cases, even when effective implementation in fact happens, it is not verified by any sort of systematic data gathering (Dane & Schneider, 1998).

As will be seen in the list of unresolved issues below, the research evidence about effective program implementation and about fidelity/adaptation balance is far from complete, and it is filled with contradictions and uncertainties. This literature review is one of the first attempts to draw together all of the relevant threads of inquiry so that judgments can be made about gaps in the research and potential strategies to follow at the several levels discussed below.

There are still some basic issues of terminology as well as methodology to be resolved. Different investigators have different definitions and terms for fidelity. The measures used by program developers to determine program fidelity vary in scope and precision. For instance, one major program is considered by the program developer to have "fidelity" if 60 percent of its sessions are administered, but this figure is never mentioned in secondary discussions of the developer's work by others, giving a potentially misleading impression.

Despite these shortcomings and inconsistencies, however, the weight of evidence does suggest that the discussions that once divided program developers concerned with fidelity and program implementers concerned with adaptation into "warring camps" are now outdated. These discussions still happen both in the literature and in the field, but the view that fidelity/adaptation is a dynamic concept in which both elements are needed for program success makes these early arguments somewhat moot. Hall and Hord (2001) assert that asking the question "Is adaptation desirable?" is asking the wrong question. Adaptation *will* happen, so the questions to be asked instead are: "How much?" and "When is a program's content damaged?"

Bauman et al. (1991) refer to the "principle of program uniqueness"—that in its actual implementation, any program will have some unique elements because of the unique characteristics of the environment. Even if one is implementing a new program in exactly the same environment, the environment has changed since the time of the previous implementation! They also point out that many programs are created under unusual conditions (special funding, charismatic leaders, etc.) that are not widely avail-

able in the field. Bauman et al., like Hall and Hord, assert that this principle of program uniqueness removes the debate from the level of the ideal—"Should we permit reinvention?"—to the actual issue: "How and what are going to change while still preserving core components faithfully?"

Reinvention of some operational components of programs is inevitable. In that context, fidelity to the innovative program model's theory base is what is most critical. It is appropriate to modify, or even replace, procedural aspects of programs, but the theory-based intermediate outcomes must be maintained. Miller and Eckholdt (1998) provide a recent example from HIV prevention. In this replication study, although significant operational reinvention of the program model was reported, the basic approaches used to impact theory-based behavioral mediators and unprotected sexual behaviors were maintained. The resulting impacts were similar to the effects obtained during the original program and its evaluation.

Larger concerns also weigh in the direction of promoting a certain amount of adaptation, despite concerns about program fidelity. Adaptation is essential in order for the community to have a role in change (Arthur & Blitz, 2000) and to meet needs for community ownership and involvement (Backer, 2000). Also, many unusual circumstances of implementation can change the nature of the implementation environment (Bauman et al., 1991). These often are difficult to measure, because there is a Hawthorne effect of measuring fidelity/adaptation. In fact, it is possible that several recent studies showing that high fidelity led to high outcomes are actually reflecting high attention to the fidelity process. High attention to the adaptation process could show the same results.

In an early suggestion for a compromise of "modified" view, Hall et al. (1975) suggest that some change is acceptable up to the zone of "drastic mutation beyond which continued dilution compromises program integrity and effectiveness." Several other writers have noted such possibilities as a middle ground between total local control and total central control of the innovation process. Overall, the position that seems best-justified by the weight of evidence reviewed here is one that comes from a nearly 20-year-old paper:

> The ultimate goal is to maintain the basic integrity of a program model while matching the innovation to the unique features of the setting and the preferences/reactions of the relevant setting. (Jason, Durlak, & Holton-Walker, 1984)

Stolz (1984) calls this "implementing loosely" and acknowledges that this could result in dilution of a program, but it is also essential for local effectiveness. This concept is similar to one advanced by Peters and Waterman (1982) as among the eight key characteristics of successful American corporations: "simultaneous loose-tight properties."

Guidelines for Balancing Program Fidelity/Adaptation

A literature review is not intended to provide detailed practice guidelines. However, program developers and implementers are asking for help in dealing with the ultimate practical question: "how to actually make a balance between fidelity and adaptation for a particular program in a particular setting." A set of six guidelines for balancing fidelity and adaptation are offered below as a preliminary response.

Little empirical research has been done to date on many of the issues about fidelity/adaptation balance, despite all the studies cited in this literature review. We do not yet know if these are precisely the steps for "setting the boundaries." However, the weight of evidence suggests that these lead in the right direction, so they become a "what-to-do-until-the-doctor-comes" set of practices. Each of the steps is based upon literature reviewed for this paper.

As one example: Bauman et al. (1991) suggest that fidelity concerns should be addressed at the level of a causal model for how change takes place as a result of the innovation (i.e., why the program works). Adaptation, on the other hand, is likely to be most appropriate at the level of the specific implementation of the program. In addition to the basic content of the program, such aspects as its level of intensity, ambiguity, and complexity, and context elements (such as how it is sponsored) also need to be taken into account. The three steps for fidelity/adaptation balancing presented in their study have been integrated into a larger six-step framework presented here.

1. Identify and understand the theory base behind the program.
Published literature on the program should provide a description of its theoretical underpinnings; if not, an inquiry to the program developer may yield this information.

This may or may not include a logic model that describes in linear fashion how the program works. The theory and logic model are not in themselves core components of a program, but they can help identify what the core components are and how to measure them. This step also identifies core values or assumptions about the program that can be used to help persuade community stakeholders of the program's fit and importance for their environment.

2. Obtain or conduct a core components analysis of the program.
This will provide implementers with a roster of the main "program ingredients," and at least some sense of which components are essential to likely success and which are more amenable to modification, given local conditions. In essence, core components analysis represents a bridge between developer and implementer, and between fidelity and adaptation. Ideally, the program developer or a third party will

already have conducted the core components analysis. If not, with good information about the program, an implementer can at least approximate this informally.

As previously noted, CSAP, through its National Center for the Advancement of Prevention, is undertaking a large-scale core components analysis of effective and model programs. Checking to see if a selected program is in the database of CSAP's National Registry of Effective Prevention Programs (NREPP) is a first step in determining the status of a core components analysis. For online access to this database, go to www.samhsa.gov/csap/modelprograms/.

3. Assess fidelity/adaptation concerns for the particular implementation site.
This step means determining what adaptations may be necessary, given the target population, community environment, political and funding circumstances, etc. And it means determining what core components are especially critical to address fidelity, given these same circumstances.

4. Consult as needed with the program developer to review the above steps and how they have shaped a plan for implementing the program in a particular setting.
This may also include actual technical assistance from the developer or referral to peers who have implemented the program in somewhat similar settings.

5. Consult with the organization and/or community in which the implementation will take place.
This is a process to allow fears and resistance to surface, build support for the program, and obtain input on how to do the implementation successfully.

6. Develop an overall implementation plan based on these inputs.
Include a strategy for achieving and measuring fidelity/adaptation balance for the program to be implemented, both at the initial implementation and over time. By addressing all of the complex stages of implementation, such a plan can increase the opportunities for making choices that shape a program, while maintaining good fidelity

Issues for Further Exploration

Many issues remain for each of the primary audiences for fidelity and adaptation balance studies, as noted below:

Issues for Researchers and Program Developers

1. How to gather evidence on the stages of implementation, including fidelity/adaptation balance, and how to make this a routine part of both research and implementation practice.
The first step is simply to gather evidence much more routinely about the implementation process itself. This is not done as much as it could, or should, be (Zins, Elias, Greenberg, & Pruett, 2000). Such research could help to establish more precisely the appropriate balance points between fidelity and adaptation for different programs, target populations, or implementation settings. Even though adaptation may be inevitable, and efforts to promote fidelity difficult, only experimental research can help sort out how this balancing act should be treated in practice. This has not really been done to date (Domitrovich & Greenberg, 2000).

Gathering more extensive evidence about fidelity/adaptation balance would help to provide a more rigorous definition of what constitutes "fidelity." There is also a need to look at the frequency of different types of adaptations: deletions, additions, modifications in content, changes in intensity.

Many writers on this subject have defined questions that could be assembled together to direct future research inquiry. For example, Mayer and Davidson (2000) point out the following issues in the fidelity/adaptation debate that still need to be solved, all of which fall under this initial evidence-gathering need:

- Is there a *middle ground*?
- Should *contextual factors* affect the decision to favor one over the other?
- What kinds of adaptation are *benign or in fact beneficial*?
- Are fidelity and *dose strength* the same or different constructs?

It may be important, too, to look at the specific role of program developers and their support organizations in the overall process of program implementation (M. A. Pentz, personal communication, April 2001). Program developers may simply not have the resources, or perhaps even the motivation, to systematically disseminate information that can be used to promote effective implementation, much less to offer consultation to implementers.

For instance, developers in academic settings are rewarded for research publications, not for providing technical assistance, which their research grants usually do not fund. Developers who do provide technical assistance usually have government or foundation funding to do so. Others have created private organizations that market their program materials and provide a revenue source that can support consultation activities. Most large-scale purchases of program materials are made by third parties (states, school districts, foundations, or corporations), which may or may not support technical assistance for implementation. Seldom are sources of funding for creating and initially validating a prevention program also sources for funding technical assistance to program implementers.

On the other hand, the quality of contracted technical assistance funded as part of a local, regional, or national implementation effort seems variable. Often contractors are not as knowledgeable about the program as the original developers, but the developers are not readily available to support these efforts.

Yet another complication comes from inherent differences between the "research standard" and the "practitioner standard" for fidelity (M. A. Pentz, personal communication, April 2000). Pentz's Midwest Prevention Project and McDonald's Families and Schools Together (FAST) (L. McDonald, personal communication, December 2000) are among the science-based prevention programs that have attempted to incorporate elements of implementer-defined fidelity into the processes by which they encourage implementation.

2. How to determine the sources of variance in fidelity.
Many writers in this field speculate that this variance comes from the appropriate and vital expression of local needs, including the need for local control of programming. However, the research reviewed for this paper suggests that there are other important factors:

- *skill* - some people are more skilled than others in undertaking program implementation activities
- *effort* - persistence and hard work also may account for some of the variance
- *task difficulty* - some implementation tasks are simply too difficult, no matter what the nature of the innovation or the strategy used to implement it
- *luck* - sometimes, just by happenstance, it works or it does not!

Only further research can help to determine the relative importance of these factors more precisely.

3. How to understand better the differential characteristics of program implementers.
Who adapts, what do they adapt and why, why do they preserve fidelity? For instance, the Emshoff et al. (under review) study shows that attention to fidelity came about because grantees were under pressure from the funder to maintain fidelity, even down to a funding mechanism that compelled adherence. The CSAP studies being conducted by NCAP also will address these concerns.

4. How to address the largely unexplored question of time horizon for fidelity/adaptation balance.
For some innovative programs, there may be high fidelity at the beginning of the implementation period, followed by successive stages of adaptation. These adaptations occur because environmental conditions change, or because there are changes in the scientific database about the program itself. This has been little explored in the research to date, which tends to look at fidelity/adaptation issues by "snapshot" rather than "motion picture."

5. How to make the instrumentation developed for research more immediately useful for program implementers.
Core components analysis, fidelity instruments, and other types of data-gathering devices described in this review have considerable potential for influencing field practice. This will more likely happen if they are presented in user-friendly formats, with adequate tie-ins to program manuals, training and technical assistance programs, and other delivery systems.

6. How to get program implementers more vigorously involved with all stages of program development.
Implementers should provide input on how best to format and distribute instruments intended to benefit them. For instance, L. McDonald (personal communication, December 2000) reports that the Families and Schools Together (FAST) implementation manual includes a range of reported experiences from program implementers about "what can go wrong," and how these challenges of previous implementers were addressed.

7. How to increase the support infrastructure for implementation and fidelity/adaptation research.
One way is to provide rewards and to allot space for more data and interpretations on these subjects in professional journals and at conferences. Another is to encourage the development of more research funding programs.

Issues for Program Implementers

The most important recommendations for program implementers were presented above, in terms of guidelines for how to address the implementation process in a practical way, including fidelity/adaptation balance. Unresolved issues tend to revolve around the mechanical aspects of fulfilling this set of recommendations: The following items need further attention:

1. How to deal with implementation costs.
This includes the practical realities of limited resources in determining needed steps for implementation and for fidelity/ adaptation balancing, even to the extent of deciding not to implement certain programs if the financial supports are not there.

2. How to learn about the complex knowledge base on this subject and how it can be practically used.
CSAP will have a key role in responding to this issue, but individual implementers and their professional or trade associations can also have a part in providing the local resources needed.

3. How to get access to capacity building resources that go beyond mere knowledge, to providing actual technical assistance in addressing fidelity/adaptation balance and other issues posed here.

4. How to generalize fidelity/adaptation and program implementation experiences, so that what is learned from an implementer's experience with one program can be transferred to others for implementation in the future.

5. How to promote leadership supportive of effective program implementation, including fidelity/adaptation balance.
G. E. Hall (personal communication, March 2001), for instance, reports that individual teacher implementers of innovations were much more likely to implement a program successfully if their school principal was appropriately supportive of their efforts.

Issues for Funders and Policymakers

1. How to create needed learning products.
Both developers and implementers need additional learning products in order to increase competence in fidelity/adaptation balance. Learning products and related items should be created and shared widely with individual practitioners, program administrators, policymakers, and researchers as they wrestle with the complex issues presented here.

Products need to cover both basic principles and practical checklists for how to conduct a fidelity/adaptation review, using the "program life cycle model" described here. Training programs need to be designed to provide hands-on, peer-connected training for using the new information. Finally, these learning resources need to be implemented in the field through larger "culture change" efforts to encourage the field as a whole to behave differently. These efforts will require partnerships with national and regional substance abuse prevention and other public health organizations.

2. How to provide needed training and technical assistance.
A training program should be created to support prevention practitioners, program administrators, and community leaders in addressing the issues of fidelity/adaptation.

Technical assistance also needs to be available on a customized basis, preferably involving program developers and experienced implementers. Program developers are one of the best sources for technical assistance because of their familiarity with their programs. Peers with prior implementation experience are also highly valuable resources. Existing systems of Federal agencies, such as the CAPT program in CSAP, can help to offer this technical assistance. Encouragement, and possibly funding support, can also be offered to other groups that interface with the community of program implementers to provide technical assistance.

In addition, there should be a program for "culture change" through such strategies as:

a. Leadership statements by key organizations at their conferences, in publications, and on Web sites, identifying fidelity/adaptation as an issue the field needs to deal with more fully;

b. Assembling "think tanks" to look at motivational, institutional, and political factors that might be shaped to support this culture change; and

c. Setting up a larger range of partnerships with other Federal agencies, foundations, and the private sector. For instance, as mentioned, the National Institute on Drug Abuse has initiated a research grant program that is concerned with identifying the components of effective drug abuse prevention programs. The grantees in this program can be contacted and requested to join in the "culture change" effort described here, along with NIDA's relevant project officers and senior prevention officials.

3. How to shape funding priorities.
To make a lasting difference in improving the quality of program implementation in substance abuse prevention, including the balancing of program fidelity and adaptation, funding priorities will need to change. Funding will need to be earmarked for these activities, both in the grants for implementation programs (as has occurred with the CSAP Family Strengthening initiative and the Department of Education Prevention Principles Program) and by creating new sources of funding for technical assistance support and field development work in this important area.

4. How to promote overall capacity building for the prevention field.
For both communities and prevention agencies, the resources recommended above can only be used fully if they are set in the larger context of efforts to strengthen the overall organization. Long-term planning for sustainability, dealing with initial needs/assets and readiness assessments, and sensitive balancing of program fidelity and adaptation are typical of the complex interventions that cannot be undertaken by weak, under-resourced entities.

As Backer and Bare (2000) make clear, capacity building for strengthening nonprofit organizations is increasingly recognized by funders as an important part of improving their overall performance. The kinds of strategies suggested here need to be considered a component of that effort, and information about the types of interventions suggested here need to be offered to the capacity building providers that serve local entities. Such efforts can be woven into the larger systems change efforts that currently exist in prevention, such as the CSAP State Incentive Grants (SIG) system.

Next Steps

The Center for Substance Abuse Prevention is already addressing many of the issues noted above. For instance, through its National Center for the Advancement of Prevention four small-scale efforts to explore unresolved issues in fidelity/adaptation balance are in progress:

1. The perspectives of program developers on fidelity/adaptation are being obtained through discussions with several prominent developers about these issues for their own programs— for example, how these developers deal with enhancements and modifications of their programs over time.
2. Perspectives of implementers for these same programs are being obtained through discussions with selected field implementers, to learn more about exactly how they deal with fidelity or adaptation challenges.
3. A review of fidelity/adaptation instruments is being conducted, to lead to information on
    a. format and content for fidelity instruments, and how these could be better standardized in the substance abuse prevention field;
    b. what steps could be taken in the field to increase the use of fidelity instruments as measures of implementation quality; and
    c. how prevention practitioners/agencies and communities can use these instruments in practical ways.
4. A thought paper is being prepared on how future progress in dealing with fidelity/adaptation balance may require obtaining information on these matters prospectively.

In the end, these and other activities proposed to increase attention to the important issue of fidelity and adaptation balance will assist program developers and implementers to achieve desired outcomes. To support the field in these efforts, CSAP is coordinating a number of developmental efforts: expanding its core components analysis work and National Registry of Effective Prevention Programs (described earlier in this paper), supporting development of additional fidelity instruments, sponsoring conference presentations about fidelity/adaptation balance, and addressing this complex issue in other CSAP products. Through these activities CSAP and the prevention field can work together to enhance the effectiveness of prevention programs, maintain accountability, and re-shape the field.

Progress Through Explorations in Other Fields

Because fidelity/adaptation balance is such a complex issue, both CSAP and prevention researchers also may find it helpful to explore other content areas that could provide new insights about how to handle fidelity/adaptation issues. Medication compliance is one area that might be especially fruitful, because that field deals with the problem of people not following the medication regimen specified for them. As medical practitioners and public health officials know only too well, a major problem in medicine today is that many people fail to follow the medication regimen specified for them, either by not taking prescribed medication at all, or stopping it too soon, or taking it under conditions different from what medical science has determined will lead to the best result with the fewest side effects.

In public health studies on this problem, it has been found that noncompliance rates of 50 percent or higher are common for major medical problems such as arthritis, seizure disorders, and diabetes. Half of patients with hypertension drop out of their medication regimen within one year, and only two-thirds of those who remain take adequate medication (Fenton, Blyler, & Heinssen, 1997). Fifty percent or higher noncompliance rates are also reported for antipsychotic medications used to treat people with schizophrenia. Some of the issues of family involvement and community stigma with mental illnesses are similar to those occurring in the substance abuse arena.

Compliance is a collaborative relationship between the patient and practitioner where both assume responsibility for producing a treatment regimen to which the patient can adhere (Corrigan, Liberman, & Engel, 1990). Barriers to this partnership may include the patient's individual psychopathology and other characteristics, characteristics of the family, the patient-clinician relationship, and treatment techniques. Eckman et al. (1992) report the successful use of modularized skill development training to deal with these factors, by which illness self-management including compliance can be increased.

According to the considerable research on this subject, noncompliance is "multidetermined." An individualized approach is best, which occurs in the context of an ongoing physician-patient relationship. This finding has many implications for the creation and maintenance of strategies for balancing fidelity and adaptation concerns in substance abuse prevention.

The research on this subject also shows the value of interventions that might be useful in the fidelity/adaptation balance for substance abuse prevention—for instance, the use of negotiation approaches between patient and professional (with input from the family). Empirical and case studies, such as those by Sotiropoulos, Poetter, and Napholz (1999); Wirshing, Marder, Eckman, Liberman, and Mintz (1992); and Fenton, et al., (1997) may be examined in this regard.

The adult education field also may provide useful input about how to design implementation strategies and achieve appropriate balance of program fidelity/adaptation. In the end, implementation almost always involves changing the behavior of adults—teachers, prevention personnel, etc.—through an educational process so that they will then implement a program properly. We know, for instance, from studies of adult education and the writings of great theorists such as Paulo Friere, that experiential learning and small group activities are among the strategies that work best for educating adults.

Implementation strategies can be designed to follow these principles, as McDonald does with her FAST program, for instance. A set of guidelines for shaping the overall implementation process, drawing on the literature about implementation reviewed here, and then using such wisdom as that from the adult education field, might be helpful for shaping future practice.

Conclusion

Bauman et al. (1991) suggest an architectural metaphor for program implementation:

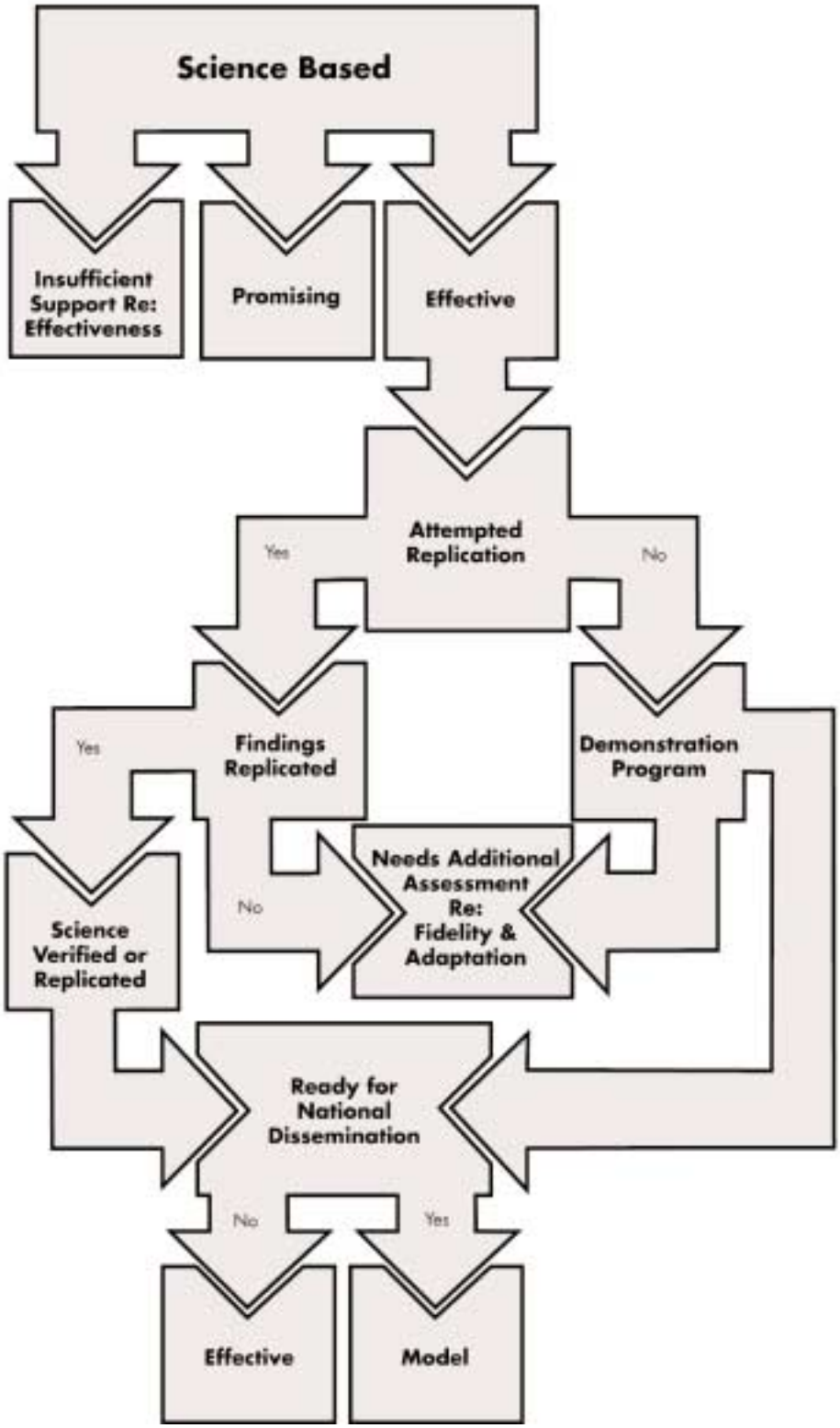
> Implementing a program is like constructing a building. An architect draws upon general engineering principles (theory) to design a building that will serve the purposes for which it is designed. However, the specific building that results is strongly influenced by parameters of the building site, such as the lot size, the nature of the site's geological features, the composition of the soil, the incline of the surface, the stability and extremes of climate, zoning regulations, and cost of labor and materials. The architect must combine architectural principles with site parameters to design a specific building for a specific purpose on a specific site.…This dynamic is mirrored in the rough-and-tumble world of the human services. Despite excellent plans and experience, ongoing redesign and adjustment may be necessary. (p. 34)

The architectural plans represent a degree of purpose in building that is similar to substance abuse prevention programming and the issues discussed in this paper. For example, adaptation is most likely to succeed when it is highly intentional, and rarely when it is accidental or careless—"It seemed like a good idea at the time."

The foregoing review of literature and the conclusions drawn from it address the desire of those working "in the trenches" of prevention to have usable strategies and principles for balancing program fidelity and adaptation and for dealing with the other stages of the program implementation process. There is a growing knowledge base on how to do this well. The recommendations made here can help both to increase the knowledge and to shape it into learning products and interventions that will increase the future quality of implementation practice in substance abuse prevention.

Appendix

CSAP's Typology of Science-Based Programs



References

Akerlund, K. M. (2000). Prevention program sustainability: The state's perspective. *Journal of Community Psychology, 28*(3), 353-362.

Allen, J. P., Philliber, S., & Hoggson, N. (1990). School-based prevention of teen pregnancy and school dropout: Process evaluation of the national replication of the Teen Outreach Program. American *Journal of Community Psychology, 18*(4), 505-524.

Altman, D. G. (1995). Sustaining interventions in community systems: On the relationship between researchers and communities. *Health Psychology, 14*(6), 526-536.

Arthur, M. S., & Blitz, C. (2000). Bridging the gap between research and practice in drug abuse prevention through needs assessment and strategic community planning. *Journal of Community Psychology, 28*(3), 241-256.

Backer, T. E. (2000). The failure of success: Challenges of disseminating effective substance abuse prevention programs. *Journal of Community Psychology, 28*(3), 363-373.

Backer, T. E. (1999). Marketing services organizations for nonprofit arts groups: Core components and replication. In John S. & James L. Knight Foundation, *Marketing the Arts.* Miami: Knight Foundation.

Backer, T. E. (1995a). Assessing and enhancing readiness for change: Implications for technology transfer. In T. E. Backer, S. L. David, & G. Soucy, (Eds.) *Reviewing the behavioral science knowledge base on technology transfer.* Rockville, MD: National Institute on Drug Abuse.

Backer, T. E. (1995b). *Dissemination and utilization strategies for foundations: Adding value to grantmaking.* Kansas City, MO: Ewing M. Kauffman Foundation.

Backer, T. E. (1991). *Drug abuse technology transfer.* Rockville, MD: National Institute on Drug Abuse.

Backer, T. E., & Bare, J. (2000). Going to the next level. *Foundation News and Commentary, September/October,* 38-40.

Backer, T. E., Brown, B. S., & Howard, E. A. (1994). *Evaluating drug abuse technology transfer: An analytic review.* Los Angeles: Human Interaction Research Institute.

Backer, T. E., David, S. L., & Soucy, G. (1995). *Reviewing the behavioral science knowledge base on technology transfer.* Rockville, MD: National Institute on Drug Abuse.

Backer, T. E., & Diaz, E. (1999). Substance abuse prevention and Latino communities: A briefing paper for the Center for Substance Abuse Prevention. Northridge, CA: Human Interaction Research Institute.

Backer, T. E., & Glaser, E. M. (1979). *Case studies of nonimplementers of the Fairweather Hospital-Community Treatment Program.* Los Angeles: Human Interaction Research Institute.

Backer, T. E., & Rogers, E. M. (1999). Briefing paper for Dissemination Best Practices Workshop. Encino, CA: Human Interaction Research Institute.

Basen-Engquist, K., O'Hara-Tompkins, N., Lovato, C., Lewis, M. J., Parcel, G. S., & Gingiss, P. (1994). The effect of two types of teacher training on implementation of Smart Choices: A tobacco prevention curriculum. *Journal of School Health, 64,* 334-339.

Basch, C. E. (1984). Research on disseminating and implementing health education programs in schools. *Journal of School Health, 54,* 57-66.

Battistich, V., Schaps, E., Watson, M., Solomon, D., & Lewis, C. (2000). Effects of the Child Development Project on students' drug use and other problem behaviors. *Journal of Primary Prevention, 21*(1), 75-99.

Bauman, L. J., Stein, R. E., & Ireys, H. T. (1991). Reinventing fidelity: The transfer of social technology among settings. *American Journal of Community Psychology, 19*(4), 619-639.

Berman, P. (1980). Thinking about programmed and adaptive implementation: Matching strategies to situations. In H. M. Ingram, & D. E. Mann (Eds.), *Why policies succeed or fail.* Beverly Hills, CA: Sage Publications.

Berman, P. (1981). Educational change: An implementation paradigm. In R. Lehming & M. Kane (Eds.), *Improving schools: Using what we know.* Beverly Hills, CA: Sage Publications.

Berman, P., & McLaughlin, M. W. (1978). *Federal programs supporting educational change: Vol. 8, Implementation and sustaining innovations* (Contract No. R-1589/8). Washington, DC: U.S. Office of Education.

Berman, P., & McLaughlin, M. W. (1977). *Federal programs supporting educational change: Vol. 7, Factors affecting implementation and continuation* (Contract No. R-1589/7). Washington, DC: U.S. Office of Education.

Blakely, C. H., Mayer, J. P., Gottschalk, R. G., Schmitt, N., Davidson, W. S., Rollman, D. B., & Emskoff, J. G. (1987). The fidelity-adaptation debate: Implications for the implementation of public sector social programs. *American Journal of Community Psychology, 15*(3), 253-269.

Boruch, R. F., & Gomez, H. (1977). Sensitivity, bias and theory in impact evaluations. *Professional Psychology, 8,* 411-434.

Botvin, G. J., Baker, E., Dusenbury, L., Botvin, E. M. & Diaz, T. (1995). Long-term follow-up results of a randomized drug abuse prevention trial in a white middle-class population. *Journal of the American Medical Association, 273,* 1106-1112.

Botvin, G. J., Batson, H. W., Witts-Vitale, S., Bess, V., Baker, E., & Dusenbury, L. (1989). A psychosocial approach to smoking prevention for urban black youth. *Public Health Reports, 104*(6), 573-582.

Brekke, J. S., & Wolkon, G. H. (1988). Monitoring program implementation in community mental health settings. *Evaluation and the Health Professions, 11*(4), 425-440.

Brown, B. B. (1998). Making a difference: Is journal publication enough? *Contemporary Drug Issues, 13,* 117-132.

Calsyn, R., Tornatzky, L. G., & Dittmar, S. (1977). Incomplete adoption of an innovation: The case of goal attainment scaling. *Evaluation, 4,* 128-130.

Chen, H. (1998). Theory-driven evaluations. *Advances in Educational Productivity, 7,* 15-34.

Connell, D. B., Turner, R., & Mason, E. (1985). Summary of findings of the School Health Education Evaluation: Health promotion effectiveness, implementation and costs. *Journal of School Health, 55*(8), 316-321.

Cook, T. D., Leviton, L. C., & Shadish, W. R. (1985). Program evaluation. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology.* New York: Random House.

Corrigan, P. W., Liberman, R. P., & Engel, J. (1990). Strategies that facilitate collaboration between practitioner and patient. *Hospital and Community Psychiatry, 41,* 1203-1211.

Dalton, J. H., Elias, M. J., & Wandersman, A. (2000). *Community psychology: Linking individuals and communities.* Stamford, CT: Wadsworth.

Dane, A. V., & Schneider, B. H. (1998). Program integrity in primary and early secondary prevention: Are implementation effects out of control? *Clinical Psychology Review, 18,* 23-45.

Datta, L. E. (1981). Damn the experts and full speed ahead: An examination of the study of federal programs supporting educational change, as evidence against directed development for local problem solving. *Evaluation Review, 3*(1), 5-32.

Dencker, S. T., & Liberman, R. P. (1995). From compliance to collaboration in the treatment of schizophrenia. *International Journal of Clinical Psychopharmacology, 9,* 75-79.

Detrich, R. (1999). Increasing treatment fidelity by matching interventions to contextual variables within the educational setting. *School Psychology Review, 28*(4), 608-620.

Domitrovich, C. E., & Greenberg, M. T. (2000). The study of implementation: Current findings from effective programs that prevent mental disorder in school-aged children. *Journal of Educational and Psycho-logical Consultation, 11*(2), 193-221.

Durlak, J. A. (1995). *School-based prevention programs for children and adolescents.* Thousand Oaks, CA: Sage.

Durlak, J. A. (1997). *Successful prevention programs for children and adolescents.* New York: Plenum Press.

Durlak, J. A. (1998). Why program implementation is important. *Journal of Prevention & Intervention in the Community, 17*(2), 5-18.

Durlak, J. A., & Wells, A. M. (1998). Evaluation of idicated preventive intervention (secondary prevention) mental health programs for children and adolescents. *American Journal of Community Psychology, 26,* 775-802.

Dusenbury, L., & Falco, M. (1995). Eleven components of effective drug abuse prevention curricula. *Journal of School Health, 65*(10), 420-425.

Eckman, T. A., Wirshing, W. C., Marder, S. R., Liberman, R. P., Johnston-Cronk, K., Zimmerman, K., & Mintz, J. (1992). Technique for training schizophrenic patients in illness self-management: A controlled trial. *American Journal of Psychiatry, 149,* 1549-1555.

Edwards, R. W., Jumper-Thurman, P., Plested, B. A., Oetting, E. R., & Swanson, L. (2000). Community readiness: Research to practice. *Journal of Community Psychology, 28(3),* 291-308.

Elliott, D. (1998). *Blueprints for violence prevention.* Goldon, CO: Venture Publishing.

Emshoff, J., Blakely, C., Gray, D., Jakes, S., Brounstein, P., & Coulter, J. (under review). An ESID case study at the Federal level. *American Journal of Community Psychology.*

Eveland, J. D., Rogers, E. M., & Klepper, C. A. (1977). *The innovation process in public organizations: Some elements of a preliminary model [Final Report].* Ann Arbor, MI: University of Michigan, Department of Journalism.

Everhart, K., & Wandersman, A. (2000). Applying comprehensive quality programming and empowerment evaluation to reduce implementation barriers. *Journal of Educational and Psychological Consultation, 11*(2), 177-191.

Felner, R. D., Phillips, R. S. C., DuBois, D., & Lease, A. M. (1991). Ecological interventions and the process of change for prevention: Wedding theory and research to implementation in real world settings. *American Journal of Community Psychology, 19*(3), 379-387.

Fenton, W. S., Blyler, C. R., & Heinssen, R. K. (1997). Determinants of medication compliance in schizophrenia: Empirical and clinical findings. *Schizophrenia Bulletin, 23*(4), 637-651.

Fetterman, D. M., Wandersman, A., & Kaftarian, S.J. (Eds.) (1996). Empowerment evaluation: *Knowledge and tools for self-assessment and accountability.* Thousand Oaks, CA: Sage.

Flay, B. R., Hansen, W. B., Johnson, A. C., Collins, L. M., Dent, C. W., Dwyer, K. M., Grossman, L., Hockstein, G., Rauch, J., Sobel, J. L., Sobol, D. F., Sussman, S., & Ulene, A. (1987). Implementation effectiveness trial of a social influences smoking prevention program using schools and television. *Health Education Research, 2*(4), 385-400.

Fullan, M., & Pomfret, A. (1977). Research on curriculum and instruction implementation. *Review of Educational Research, 47*(2), 335-397.

Gager, P. J., & Elias, M. J. (1997). Implementing prevention programs in high-risk environments: Application of the resiliency paradigm. *American Journal of Orthopsychiatry, 67*(3), 363-373.

George, A. A., Hall, G. E., & Uchiyama, K. (2000). Extent of implementation of a standards-based approach to teaching mathematics and student outcomes. *Journal of Classroom Instruction, 35*(1), 8-25.

Gingiss, P. L. (1992). Enhancing program implementation and maintenance through a multiphase approach to peer-based staff development. *Journal of School Health, 62*(5), 161-166.

Glaser, E. M., & Backer, T. E. (1980). Durability of innovations: How Goal Attainment Scaling programs fare over time. *Community Mental Health Journal, 16*(2), 130-143.

Glaser, E. M., & Backer, T. E. (1977). Innovation redefined: Durability and local adaptation. *Evaluation, 4,* 131-135.

Glaser, E. M., & Backer, T. E. (1972). A clinical approach to program evaluation. *Evaluation, 1,* 54-59.

Goodman, R. M. (2000). Bridging the gap in effective program implementation: From concept to application. *Journal of Community Psychology, 28*(3), 309-322.

Goodman, R. M., McLeRoy, K. R., Steckler, A., & Hoyle, R.H. (1993). Development of level of institutionalization scales for health promotion programs. *Health Education Quarterly, 20*(2): 161-178.

Goodman, R. M., & Steckler, A. (1989). A framework for assessing program institutionalization. *Knowledge, 2,* 57-71.

Goodman, R. M., & Wandersman, A. (1994). FORECAST: A formative approach to evaluating community coalitions and community-based initiatives. *Journal of Community Psychology, (CSAP special issue),* 6-25.

Gray, D. O., Emshoff, J., Jakes, S., & Blakely, C. (under review). ESID, dissemination research and community psychology: A case of partial implementation? *American Journal of Community Psychology.*

Gresham, F. M., Gansle, K. A., Noell, G. H., Cohen, S., & Rosenbaum, S. (1993). Treatment integrity of school-based behavioral intervention studies. *School Psychology Review, 22,* 254-272.

Hall, G. E. (1992). The local educational change process and policy implementation. *Journal of Research in Science Teaching, 29,* 877-904.

Hall, G. E., & George, A. (2000). *The use of innovation configuration maps in assessing implementation: The bridge between development and student outcomes.* Paper presented at the annual meeting of the American Educational Research Association.

Hall, G. E., & Hord, S. M. (2001). *Implementing change: Patterns, principles, potholes.* New York: Allyn & Bacon.

Hall, G. E. (1999). Using constructs and techniques from research to facilitate and assess implementation of an innovative mathematics curriculum. *Journal of Classroom Instruction, 34*(1), 1-8.

Hall, G. E., et al (1975). Levels of use of the innovation: A framework for analyzing innovation adoption. *Journal of Teacher Education, 26,* 52-56.

Hallfors, D., Sporer, A., Pankratz, M., & Godette, D. (2000). *Drug-Free Schools Survey: Report of results.* Chapel Hill, NC: University of North Carolina.

.

Hansen, W. B. (1999). Fidelity: Snatching victory from the jaws of defeat. Unpublished paper.

Hansen, W. B., Graham, J. W., Wolkenstein, B. H., & Rohrbach, L.A. (1991). Program integrity as a moderator of prevention program effectiveness: Results for fifth grade students in the Adolescent Alcohol Prevention Trial. *Journal of Studies on Alcohol, 52*(6), 568-579.

Hansen, W. B., & McNeal, R. B. (1999). Drug education practice: Results of an observational study. *Health Education Research, 14*(1), 85-97.

Hawkins, J. D., & Arthur, M. W. (2001). *Diffusion of risk and protection-focused prevention in states and communities.* Seattle: University of Washington, Social Development Research Group.

Jason, L. A., Durlak, J. A., & Holton-Walker, E. (1984). Prevention of child problems in the schools. In M.C. Roberts & L. Peterson (Eds.), *Prevention of Problems in Childhood.* New York: Wiley.

Kretzmann, J., & McKnight, J. (1993). *Building communities from the inside out: A path toward finding and mobilizing a community's assets.* Chicago: ACTA Publications.

Kumpfer, K. L., Whiteside, H. O., & Wandersman, A. (1997). *Community readiness for drug abuse prevention: Issues, tips and tools.* Rockville, MD: National Institute on Drug Abuse.

Kumpfer, K. L., Shur, G. H., Ross, J.G., Bunnell, K. K., Librett, J. J., & Millward, A. R. (1993). *Measurements in prevention: A manual on selecting and using instruments to evaluate prevention programs.* Rockville, MD: Center for Substance Abuse Prevention

Lamb, S., Greenlick, M. R., & McCarty, D. (Eds.) (1998). *Bridging the gap between practice and research: Forging partnerships with community-based drug and alcohol treatment.* Washington, DC: National Academy Press.

Leithwood, K. A., & Montgomery, D.J. (1980). Evaluating program implementation. *Evaluation Review, 4*(2), 193-214.

Mayer, J. P., Blakely, C. H., & Davidson, W. S. (1986). Social program innovation and dissemination: A study of organizational change processes. *Policy Studies Review, 6*(2), 273- 287.

Mayer, J. P., & Davidson, W.,S. (2000). Dissemination of innovation and social change. In J. Rappaport & E. Seidman (Eds.), *Handbook of community psychology.* New York: Kluwer Academic/Plenum Publishers.

McCormick, L. K., Steckler, A., & McLeroy, K. R. (1995). Diffusion of innovation in schools: A study of adoption and implementation of school-based tobacco prevention curricula. *American Journal of Health Promotion, 9,* 210-219.

McDonald, L. (1998). *FAST team trainer manual steps to certification.* Madison, WI: Edgewood College, FAST Training and Evaluation Center.

McGrew, J. H. & Bond, G. R. (1995). Critical ingredients of Assertive Community Treatment: Judgment of the experts. *Journal of Mental Health Administration, 22,* 113-126.

Miller, R. L., & Eckholdt, H. M. (1998). HIV prevention with male prostitutes and patrons of hustler bars: Replication of an HIV preventive intervention. *American Journal of Community Psychology, 26,* 97-131.

Oetting, G. R., Donnermeyer, J. F., Plested, B. A., Edwards, R. W., Kelly, K., & Beauvais, F. (1995). Assessing community readiness for prevention. *The International Journal of Addictions, 30*(6), 659-683.

Palumbo, D. J., Maynard-Moody, S., & Wright, P. (1984). Measuring degrees of successful implementation: Achieving policy versus statutory goals. *Evaluation Review, 8*, 45-74.

Palumbo, D. J., & Oliverio, A. (1989). Implementation theory and the theory-driven approach to validity. *Evaluation and Program Planning, 12*, 337-344.

Parcel, G. S., Ross, J. G., Lavin, A. T., Portnoy, B., Nelson, G. D., & Winters, F. (1991). Enhancing implementation of the teenage health teaching modules. *Journal of School Health, 61*(1), 35-38.

Pentz, M. A. (2000). Institutionalizing community-based prevention through policy change. *Journal of Community Psychology, 28*(3), 257-270.

Pentz, M. A., Trebow, E. A., Hansen, W. B., MacKinnon, D. P., Dwyer, J. H., & Johnson, C. A. (1990). Effects of program implementation on adolescent drug use behavior. *Evaluation Review, 14*(3), 264-289.

Peters, T. & Waterman, R. H. (1982). *In search of excellence.* New York: Harper & Row.

Roberts-Gray, C., & Gray, T. (1983). Implementing innovations: A model to bridge the gap between diffusion and utilization. *Knowledge: Creation, Diffusion, Utilization, 5*(2),: 213-232.

Rogers, E. M. (1995a). Diffusion of drug abuse prevention programs: Spontaneous diffusion, agenda setting, and reinvention. In T. E. Backer, S. L. David, & G. Soucy (Eds.) *Reviewing the behavioral science knowledge base on technology transfer.* Rockville, MD: National Institute on Drug Abuse.

Rogers, E. M. (1995b). *Diffusion of innovations.* New York: Free Press.

Rohrbach, L. A., D'Onofrio, C. N., Backer, T. E., & Montgomery, S. B. (1996). Diffusion of school-based substance abuse prevention programs. *American Behavioral Scientist, 39*(7), 919-934.

Rohrbach, L. A., Graham, J. W., & Hansen, W. B. (1993). Diffusion of a school-based substance abuse prevention program: Predictors of program implementation. *Preventive Medicine, 22*, 237-260.

Scheirer, M. A. (1982). *Program implementation: The organizational context.* Beverly Hills, CA: Sage.

Scheirer, M. A. (1996). A user's guide to program templates: A new tool for evaluating program content. *New Directions for Evaluation, No. 72.*

Scheirer, M. A. & Rezmovic, E. (1983). Measuring the implementation of innovations. *Evaluation Review, 7*, 599-633.

Smith, D. W., Stecker, A., McCormick, L. K., & McLeroy, K. R. (1995). Lessons learned about disseminating health curricula to schools. *Journal of Health Education, 26*, 37-43.

Sobol, D. F., Rohrbach, L. A., Dent, C. W., Gleason, L., Brannon, B., Johnson, C. A. & Flay, B. R.(1989). The integrity of smoking prevention curriculum delivery. *Health Education Research, 4*(1), 59-67.

Sorenson, J. L., Hall, S. M., Loeb, P., Allen, T., Glaser, E. M., & Greenberg, P. D. (1988). Dissemination of a job seekers' workshop to drug treatment programs. *Behavior Therapy,* 19, 143-155.

Sotiropoulos, P., Poetter, K. & Napholz, L. (1999). A case study of psychiatric medication noncompliance. *Journal of the University of Arizona College of Nursing, September,* 1-7.

Spoth, R., Redmond, C., Kahn, J., & Shin, C. (1997). A prospective validation study of inclination, belief and context predictors of family-focused prevention involvement. *Family Process, 36,* 403-429.

Spoth, R., Goldberg, C., & Redmond, C. (1999). Engaging families in longitudinal preventive intervention research: Discrete-time survival analysis of socioeconomic and social-emotional risk factors. *Journal of Consulting and Clinical Psychology, 67*(1), 157-163.

Spoth, R., Redmond, C., & Lepper, H. (1999). Alcohol initiation outcomes of universal family-focused preventive interventions: One- and two-year follow-ups of a controlled study. *Journal of Studies on Alcohol, Supp. 13 [March],* 103-111.

Spoth, R., Redmond, C., & Shin, C. (1998). Direct and indirect latent-variable parenting outcomes of two universal family-focused preventive interventions: Extending a public health-oriented research base. *Journal of Consulting and Clinical Psychology, 66*(2), 385-399.

Stolz, S. B. (1984). Preventive models: Implications for a technology of practice. In M. C. Roberts & L. Peterson (Eds.), *Prevention of problems in childhood.* New York: Wiley.

Tobler, N. S., & Stratton, H. H. (1997). Effectiveness of school-based drug prevention programs: A meta-analysis of the research. *Journal of Primary Prevention, 18*(1), 71-128.

Tornatzky, L. G., & Klein, K. J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on Engineering Management, 29,* 28-45.

Tornatzky, L. G., Fergus, E., Avellar, J., & Fairweather, G. W. (1980). *Innovation and social process.* Elmsford, NY: Pergamon Press.

Tricker, R., & Davis, L. H. (1988). Implementing drug education in the schools: An analysis of the costs and teacher perceptions. *Journal of School Health, 58*(5), 181-185.

Wirshing, W. C., Marder, S. R., Eckman, T. A., Liberman, R. P., & Mintz, J. (1992). Acquisition and retention of self-management of illness skills in chronic schizophrenic outpatients. *Psychopharmacology Bulletin, 28,* 241-245.

Yin, R. (1978). *Changing urban bureaucracies: How new practices become routinized.* Santa Monica, CA: The RAND Corporation.

Zins, J. E., Elias, M. J., Greenberg, M. T., & Pruett, M. K. (2000). Promoting quality implementation in prevention programs. *Journal of Educational and Psychological Consultation, 11*(2), 173-174.

In Appreciation

Thanks are extended to Dr. Steven Schinke, Columbia University, and Dr. Nancy Jacobs, John Jay Criminal Justice Research Center, City University of New York, for their many contributions to this paper, produced as one part of our work together on the Center for Substance Abuse Prevention's National Center for the Advancement of Prevention. The following individuals served very helpfully as expert reviewers of the paper in several draft stages, providing both conceptual and practical input:

Craig Blakely, Texas A&M University
James Derzon, Pacific Institute for Research and Evaluation
Joseph Durlak, University of Illinois
Delbert Elliott, University of Colorado
James Emshoff, Georgia State University
Gene Hall, University of Nevada
William Hansen, Tanglewood Research
Lynn McDonald, University of Wisconsin
Mary Ann Pentz, University of Southern California
Everett Rogers, University of New Mexico
Richard Spoth, Iowa State University
Sue Thau, Consultant

Staff of the Human Interaction Research Institute who supported development of this paper included Elizabeth Howard, Kimarie Klahn, U. Sue Koone, Cynthia Kunz, and Terri Ruddiman.

2001 CADCA Conference Edition

Program Fidelity and Adaptation in Substance Abuse Prevention

FAXBACK FEEDBACK

"Program Fidelity and Adaptation in Substance Abuse Prevention, A State-of-the-Art Reveiw" is intended for use by prevention practitioners and professionals at the state and local levels.

Please rate your satisfaction with following dimensions of this publication.

C O N T E N T	Very Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Very Satisfied
1. Relevance of the information					
2. Accuracy of the information					
3. Timeliness of the information					

F O R M A T	Very Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Very Satisfied
1. Overall Presentation					
2. Readability					
3. Organization					

U T I L I T Y	Very Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Very Satisfied
1. Will be useful next year					
2. Useful to selected asudience					
3. Product is useful given expected expense					

COMMENTS: _____

SUGGESTED TOPICS FOR SIMILAR PRODUCT DEVELOPMENT: _____

_____

AFFILIATION: _____ POSITION: _____

Please fax your feedback to the National Center for the Advancement of Prevention at (301) 984-6095.

How to obtain this document:

This document can be obtained online at Internet sites sponsored by the Federal Center for Substance Abuse Prevention (CSAP):

CSAP Prevention Decision Support System (DSS) Web site:
www.preventiondss.org

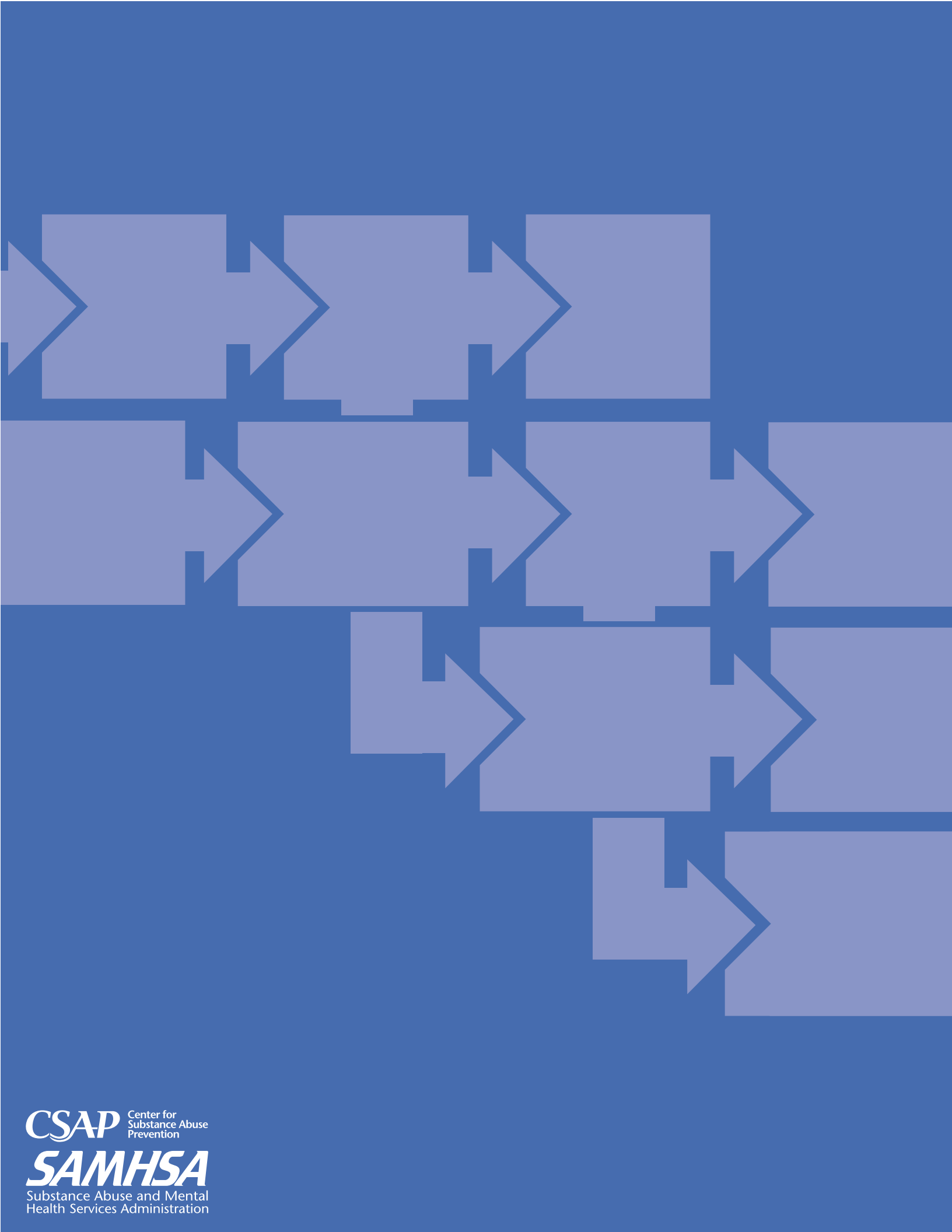
CSAP Prevention Pathways Web site:
www.samhsa.gov/preventionpathways

CSAP Model Programs Web site:
www.samhsa.gov/centers/csap/modelprograms/

How to obtain information about this document:

Contact CSAP's
National Center for the Advancement of Prevention (NCAP)
11400 Rockville Pike, Suite 209
Rockville, MD 20852
tele: (301) 984-8470
fax: (301) 984-6095
jarmstrong@ncap2000.net

NCAP National Center for the Advancement of Prevention
Center for Substance Abuse Prevention



CSAP Center for Substance Abuse Prevention

SAMHSA

Substance Abuse and Mental Health Services Administration